V2 A CYCLOPEDIA OF EDUCATION

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A
CYCLOPEDIA OF EDUCATION

EDITED BY

PAUL MONROE, Ph.D.

PROFESSOR OF THE HISTORY OF EDUCATION, TEACHERS COLLEGE
COLUMBIA UNIVERSITY

WITH THE ASSISTANCE OF DEPARTMENTAL EDITORS
AND
MORE THAN ONE THOUSAND INDIVIDUAL CONTRIBUTORS

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A CYCLOPEDIA OF EDUCATION

CHURCH ATTENDANCE OF SCHOLARS. — In the Middle Ages it was very usual for the elementary school to be held in the church itself, or in a room over the porch, or even in the belfry. Education and religion were intimately combined. The earliest schoolbooks were in effect prayer books; the A B C and the primer were schoolbooks for children, though adults, and lay people, generally, also used the primer in church. The *Expositio Sequentiarum* and the *Expositio Hymnorum* were also schoolbooks based on the church service. Thus we may say without doubt that the parochial school children in the Middle Ages attended church every day. The same was certainly true of the song schools (*q.v.*) attached to the cathedral and secular houses and monasteries.

England. — In the Westminster Song School Rules for the Behavior of School Boys (*Westminster Mss.*, edited by M. R. James) there is a full account of the daily attendance of the boys at church. "On entering the church they must make the sign of the cross, and repeat the Lord's Prayer and the Salutation of the Blessed Virgin with a genuflection before the Crucifix. Then they must rise and go into the choir two and two humbly and piously; they must bow in the middle of the choir modestly towards the altar and then withdraw each one to his stall or seat." Then follow long and detailed directions as to their behavior. Somewhat similar rules dealt with the boys in the grammar schools, which were until the fourteenth century exclusively religious schools. The practice of the cathedral grammar school in respect to church attendance was followed by the schools of the smaller secular houses. After the Reformation most grammar schools of any importance provided for this by their statutes. Mr. Foster Watson gives us a number of instances of such statutes, which made it necessary for grammar school boys to attend church on Sundays, holidays, festivals, and (perhaps) on Wednesday and Friday, at any rate in Lent. It was the usual practice for the children to make notes on the sermons and to be examined thereon. In the licenses issued to schoolmasters they were directed to take the children to church to hear divine service and sermons. Article 79 of the Ecclesiastical Canons of 1603 applied both to grammar and parochial schools. It runs as follows: "As often as any sermon shall be upon holy and festival days within the parish where they teach, schoolmasters shall bring their scholars to the church where such sermon shall be made, and then see them quietly and soberly behave themselves; and shall examine them at times convenient, after their return, what they have borne away of such sermons." In the case, however, of *Belcham* v. *Barnardiston* (Peere Williams' Reports, Vol. I, p. 32, n.) it was decided (1699) that a schoolmaster could not be prosecuted in the ecclesiastical courts for not bringing his scholars to church in accordance with this canon. The Act of Uniformity of 1662 made it in effect necessary for all schoolmasters to take their children to church, and Archbishop Sheldon in his orders to the bishops of his province asked (4) "whether the said schoolmasters, ushers, schoolmistresses, and instructors, or teachers of youth, publicly or privately, do themselves frequent the public prayers of the church, and cause their scholars to do the same." But stern legislation had the effect of destroying, not of fostering, religious education, and as the eighteenth century dragged its slow length along, very many of the smaller grammar schools gradually ceased to have any scholars to attend church. The charity schools of course sent their boys and girls to church on Sundays, and in various districts pews were reserved for these children; the little parish elementary school, of course, also attended church as in duty bound; while the grammar schoolboys, when there were any, went to church. The growth of the monitorial schools through the efforts of Lancaster and Bell (*qq.v.*) largely revived the church attendance of schools from the early days of the nineteenth century. The children in the schools of the National Society (*q.v.*) attended church regularly on Sundays and feast days, and the church voluntary schools throughout the century sent their children to church on Sundays and feast days. In Mr. Brougham's Education Bill of 1820 it was provided that children in the church schools should attend church, and the children in the schools of dissenting sects should attend the chapels of the sects. To this day the children in the church voluntary or "non-provided" schools attend church as a rule on Sunday if they are the children of church people, though of course there is no compulsion in the case. The Elementary Education Act, 1870 (sec. 7 and 74), provides that no school bylaw "shall require any child to attend school on any day exclusively set apart for religious observance by the religious body to which his parent belongs," and in the case of *Marshall* v. *Graham* (1907, 2 K.B. 112) it was decided that Ascension Day is such a day. On these days it is the practice for the church children to attend church in the case of the voluntary schools. The attendance of scholars at church is thus to-day, for a very large percentage (perhaps 40 per cent) of the elementary scholars of the country the practice, thus preserving an educational continuity of practice that goes back for many centuries. In the case of the great endowed boarding schools the school chapel takes the place of the church, while in the universities of Oxford and Cambridge attendance at the Church of England chapel on so many occasions a week is only excused on conscientious grounds stated in the case of minors by the parent or guardian.

Germany. — So long as the schools were directly attached to church institutions there was no question but that pupils must attend all the services. This practice was taken over by the Latin schools which were established by municipalities. Frequently the pupils formed the choir of the local church, so that they were compelled to attend all the services. A further interference with school work was caused by the compulsory attendance of pupils at weddings and funerals. These practices were taken over at the Reformation, and most of the church and school ordinances of the sixteenth century have reference to the attendance of pupils in church. Gradually the ordinances, evidently recognizing the disturbance and interference with class work, limit the number of services which the pupils must attend. The Goldberg School Laws (1546) insisted on attendance on Sunday, Wednesday, and Friday; the Würtemberg Ordinance (1559) on Sunday, Friday, and one other day; the Frankfort School Ordinance (1579) on Sunday and Wednesday; the Pomeranian Ordinance (1539) limited the services to a quarter of an hour. A large number of ordinances refer only to attendance on Sundays, as in the Magdeburg School Ordinance (1553), Pomeranian Church Ordinance (1563), Brandenburg School Ordinance (1564), Sturm's Class Letters (1565). In many cases the pupils were examined on the sermon, and this is provided for in the Brandenburg School Ordinance (1564), Pomeranian Church Ordinance (1563), Stralsund School Ordinance (1591). Naturally the teachers attended with their pupils, if for no other reason than to maintain order and decorum. If there were a number, they were distributed among the pupils, switch in hand, to be used, if necessary, during the service. Apparently care had to be taken to prevent the pupils from creeping under the seats, or purposely singing out of tune, or inattention to the sermon. In these secondary schools the practice of attending church in a body gradually died out in the eighteenth century. The attendance of pupils from the elementary schools was also made compulsory by the Ordinances following the Reformation. In fact, the schools existed for the Church. The curriculum was mainly a preparation for the church service, including as it did religious instruction and singing. This connection in the country schools was particularly significant because the sexton and school teacher were frequently one and the same. In many ordinances provision was made for the examination of pupils in the catechism on Sunday as well as for the teaching of the catechism to those who did not attend school. Just as at an earlier date the pupils of the Latin schools were employed to sing at funerals, so this task later devolved on the pupils of the elementary schools. The practice of compulsory attendance continued much later in connection with the elementary schools than with the Latin. According to the *General-Landschulreglement* of 1763 parents were compelled to send their children to the teacher on Sunday in order that they might be brought to church in an orderly manner and be under supervision. When the schools became state supported institutions, the compulsory attendance of pupils at church gradually disappeared, although the intimate connection between the church and the school served to some extent to maintain the practice. The teacher, however, particularly in the rural districts, was compelled to attend services in his office of church servant. More and more the periods of religious instruction were employed both by teachers and pastor to influence the pupils to attend the church. At present there is a gradual weakening of the church control over the school pupils. Sunday schools are not widely provided as yet in Germany. Considerable attention is, however, paid by the Church to the pupils for a few months before confirmation, and during that period they are permitted to leave school to attend the church at any time during the week.

America. — The practice has long since ceased to be common in America, if indeed it can be said that it ever was. The only law regularly passed in New Netherland regarding schools required that the schoolmasters of the two church schools in New Amsterdam "on Wednesday, before the beginning of the sermon, with the children entrusted to their care, shall appear in the church to examine, after the close of the sermon, each of them his own scholars . . . what they, in the course of the week, do remember of the Christian commands and catechism." The New England grammar schools, following the English custom, required, "That all the Latten Schollers and all other of ye Boyes of competent age and capacity give the Mr an accompt of one passage or sentence at least of ye sermons of the foregoing Sabath on ye 2d day morning" (New Haven Hopkins Grammar School, 1684). The latest instance appears in the New York Lancasterian schools. The religious training of the boys had from the first been a matter of concern. The Bible was read daily. Tuesday afternoon came to be given up to catechizing by the several denominations, and all the children were required to meet on Sunday mornings at their respective schools, and proceed thence under the direction of monitors to the places of public worship to which they respectively belonged.

See BIBLE IN THE SCHOOLS; CHURCH SCHOOLS; RELIGIOUS EDUCATION; MORAL EDUCATION, etc.

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CHURCH DIVINITY SCHOOL OF THE PACIFIC, SAN MATEO, CAL. — Opened in 1903 as a divinity school for candidates for orders. The course offered is one of three years. The Rt. Rev. William Ford Nicholls, D.D., Bishop of California, is the dean of the faculty.

CHURCH LADS' BRIGADES. — See BOYS' BRIGADES.

CHURCH SCHOOLS. — The Church is the mother of medieval and so of modern education throughout the Western world. Though in later times she was rather an unjust stepmother than a nursing mother, yet for 950 years, from 600 to 1550, the Church was the sole provider and protector of education. Some have sought to give the church schools a much longer pedigree, and have traced them to the catechists of the early Church and talked of the catechetical schools of Alexandria in the days of Clement of Alexandria as the origin of the schools of Europe. This, however, is a mistake. (See CHRISTIAN EDUCATION IN THE EARLY CHURCH.) The catechist was not a schoolmaster in the ordinary sense, and the catechumens were grown-up persons in process of conversion to Christianity. They were not scholars, any more than are the people who attend missionary services or seek instruction in the tenets, say, of Christian Science or Theosophy to-day. The education of young Christians as of young heathens went on in the Public Schools of grammar and rhetoric, spread abroad in all the provinces of the Empire. St. Ambrose and St. Augustine (*qq.v.*) were both of them pupils in these schools in their youth and masters in them in their mature age; as much as Julian the Apostate himself, who went "to the Basilica, where the boys' schools then were." But the Basilica here does not seem to mean the church, but the Law Court. For some reason law courts were then being transmuted into both schools and churches. As late as 515, the works of Ennodius, a native of Gaul who became Bishop of Pavia, include one of his orations made on the occasion of the school at Milan removing into a building by the Forum, which had been the law court or Basilica. A chance phrase of his, " I now detest the very name of liberal studies," spoken in the vein of Faust, weary of study and longing for a more active life, has been twisted into condemnation of education and of the study of the classics by the Church. But in another school oration he contrasts the pleasing work of the schoolmaster, " drawing water from the Castalian spring itself," with his own dreary work as a preacher, " shut into a corner of the church," and advises Arator, who afterwards turned the Acts of the Apostles into Latin hexameters, to think twice before he gives up the life of a man of the world for that of a scholar. The public schools only disappeared in the sixth century under the barbarian conquests; and the provision of education and teaching of grammar schools was then taken up by the bishops (see BISHOPS' SCHOOLS). As their dioceses and duties grew, the bishops could not long teach schools in person, and soon devolved the duty on schoolmasters appointed by them; and the eighth century saw schools established as a regular part of the cathedral establishments, taught by one of the clerks of the bishop (see CATHEDRAL SCHOOLS), the Schoolmaster, *Scholasticus*, *Écolâtre*, or *Magister Scholarum.* But the *Scholasticus* also had other duties, that of being the lawyer and secretary of the chapter, or chancellor (*q.v.*), and he in turn devolved his teaching duties on the grammar schoolmaster. He retained, however, the theological teaching as the work of the Chancellor's School (*q.v.*), and the superintendence of grammar schools throughout the area of the jurisdiction of the cathedral chapter. This area, originally coterminous with the diocese, became circumscribed by the growth of other churches of canons, and when we arrive at the era of records, we find the chancellors, whether called by that name or not, of these churches (see COLLEGIATE CHURCH SCHOOLS) enjoying the same right of teaching or supervising schools in their jurisdiction as the chancellor of the cathedral itself in his.

Meanwhile the universities had developed as legal schools in Italy, as theological schools at Paris, as mainly theological, but also legal, schools at Oxford. The origin of Paris University may be traced to the facilities afforded by the existence of the independent collegiate church of St. Genevieve to teachers like Abélard (*q.v.*), suspected of free thought, to escape the control of the Chancellor of the cathedral of Notre Dame, and, for the multiplication of teaching masters. That of Oxford, similarly, may be found in the collegiate churches of St. Frideswide and St. George, which afforded freedom from the Chancellor of Lincoln. In the thirteenth century, indeed, we find the jurisdiction of the chancellor of that vast diocese, which extended from Lincoln to Oxford and from Northampton to St. Alban's, restricted to the county of Lincoln only. But though the universities escaped from the control of the chancellor, and then, by

Papal Bulls of exemption, from that of the bishop of the dioceses in which they lay, they did not escape, nor want to escape, from the protection and control of the Church, with all the privileges and immunities from lay control enjoyed by the clerical order. On the contrary, they brought a large contingent of lay folk under the control of the Church. All suits, and even criminal cases, between scholars and laymen, came under the cognizance of the Rector of Paris University, of the Chancellors of Oxford and Cambridge, and of the schoolmasters of Canterbury and Orleans, and the rents of the halls and houses they lived in were settled by joint boards of scholars and townsmen. The servants of scholars, the booksellers, parchment providers, stationers, and other tradesmen, who ministered to the wants of the scholars, were ranked as clerics and subject to the Chancellor's jurisdiction. The grammar schools and song schools of the churches, too, enjoyed an absolute monopoly. No one was allowed to teach a grammar school without a license from the schoolmaster of St. Paul's in the whole city of London, except in the equally privileged areas of the royal chapel or collegiate church of St. Martin's-le-Grand and the archbishop's peculiar of St. Mary-le-Bow. The same rule prevailed, and documents of the thirteenth and fourteenth centuries show it in process of enforcement, at York, Lincoln, Beverley, Worcester, Gloucester, St. Alban's, and Bury St. Edmund's. A similar monopoly in favor of the song school was enforced by the precentor at York, Lincoln, and Bury St. Edmund's. At the beginning of the fifteenth century, an attempt to enforce this monopoly through the lay courts, in the Gloucester School case in 1410 was defeated in the Common Pleas because the Court held that schools were a spiritual matter and not cognizable in the Common Law courts. As the monopoly was successfully enforced by the bishop even in 1500, it is not easy to understand why the attempt was made. A counter effort by a lay court, the Mayor's Court of London, to break down the monopoly in London by issuing a prohibition against the privileged masters suing unauthorized rivals in Court Christian, was defeated by the monopolists asking the King for a Writ of Privy Seal addressed to the Mayor. Long after the Reformation, instances of the enforcement of this monopoly are to be found, at Exeter in 1625 by the bishops in favor of the old Cathedral Grammar School, and at Winchester in 1632 by the Archbishop of Canterbury, on behalf of Winchester College School. But in these two instances, the opponents of monopoly eventually prevailed, at Exeter by getting a charter from the Crown, and at Winchester by getting the archbishop to withdraw his prohibition, in favor, in both cases by a curious coincidence, of a new school in an old St. John's Hospital.

Not only was secondary and higher education provided and controlled by the Church, but elementary education also. The song schools of the great churches were the original provision for this. The song schoolmaster taught reading and grammar, so far as the Parts of Speech, but no farther, as preliminary to singing. It was a song school which Chaucer's Little Clergeon in the *Prioress' Tale* attended, when his "felaw" said, "I lerne sing, I can but small grammaire." Outside the great churches elementary education was almost everywhere provided by the Parish Clerk. He was a very different person from his modern successor. He was in orders, fourth from the highest, the priest, to the lowest, doorkeeper (*ostiarius*). Pope Leo IV, in 855, prescribed that every priest should have a clerk, a scholar, to read the epistle or lesson. At a visitation by Hincmar of Rheims a few years later one of the articles was whether the parish priest had " a clerk who can keep a school and read the epistle." The *Decretals* of Gregory IX reproduced Leo's decree, adding that the priest was to direct his parishioners to send their sons to the church to be taught. As a means of paying him for his teaching, the clerk was allowed to charge for carrying round the holy water and the holy bread. Sometimes the part of holy water carrier (*aquae bajulus*) was used as an exhibition for a poor scholar, not for the elementary schoolmaster, as in Peckham's *Injunctions* in the thirteenth and William of Wykeham's in 1368. In the fourteenth century we find appointments by the Prior of Durham in the priory's possession, in Yorkshire to a reading school distinct from the song school and the grammar school. In 1305 at Lincoln all the parish clerks of the city were had up before the precentor and warned not to teach singing without the license of the song schoolmasters of the cathedral. In the fifteenth century and onward the reading and song schools seem to have been identified, while arithmetic or computation were considered an appendix of the writing school, in the colleges of Acaster, *c.* 1460, and Rotherham, *c.* 1480. In places so far apart as Coventry, 1462, and Bristol, 1452 and 1502, the duty of teaching reading is expressed or implied as one of the principal duties of the Parish Clerk. This continued after the Reformation. White Kennet in 1695 lays it down as part of the proper duties of the Parish Clerk " to instruct children in reading and writing and rehearsing the church catechism." The courts of law after the Toleration Act held that elementary schools were exempt from the jurisdiction of the ordinary, and so private schools and dissenting schools were enabled to compete with the church schools. Yet even in 1801 a writer in the *Gentleman's Magazine* complaining of the decadence of parish clerks suggested that they should be taken from a better class " so as to make good parish schoolmasters." It was at this very time that the wide extension of "National" schools re-riveted the control of the Church over elementary education. Until 1870 the great majority and until 1902 more than half the so-called public elementary schools were strict church schools. And the schoolmaster has still to play the organ in church and teach the choir, as he did in the day schools of the fifteenth century. In spite of the Education Acts, 1870 to 1902, and the fact that now public elementary schools live on grants of money from Parliament, many are still under strict church control. A. F. L.

See CHRISTIAN EDUCATION IN THE EARLY CHURCH; also BISHOPS' SCHOOLS; MONASTIC SCHOOLS; REFORMATION AND EDUCATION, etc.

CICERO, MARCUS TULLIUS. — The most human of the Romans, is famous as one of the greatest orators of antiquity and as the greatest master of literary style among the Romans. A friend of Julius Cæsar and of most of the influential Romans of the period, he has left us a collection of more than eight hundred letters, which constitute an invaluable body of material for the study of the manners and politics of his time, as well as for the discussion of the character of the writer. During the latter part of his life, when the political conditions at Rome compelled his retirement from public life for a time, he devoted himself to the composition of treatises on Oratory and on various sides of Philosophy. In these he followed in the main Greek works on the same subjects, but he expounded these in a thoroughly luminous and sympathetic manner, and the addition of his own experience made them delightful as well as important elements in forming the minds of later generations. Even in his lifetime Cicero was recognized as the creator of the Latin literary style, and from that time to the present no Roman author or modern writer of Latin has been uninfluenced by his style. During the revival of learning the humanists regarded him as a perfect stylistic model, and Ciceronianism (*q.v.*), as it came to be called, dominated the whole age. Consequently all students of Latin imitated Cicero from the beginning, and the position he then occupied in the schools has not been seriously impaired up to now. At the outset his letters, his *Offices*, as well as his orations, were read by schoolboys, but as the time devoted to Latin has diminished, a selection from the orations has come to be the chief work studied in schools, although various attempts have been made to read a few of the letters in illustration of the history of the period, or of Cicero's own character.

The only ancient life that has come down to us is that by Plutarch, but there is a considerable amount of material to be obtained from his correspondence and from his other works, while subsequent authors make numerous references to him. The most practical modern life is by Strachan-Davidson (New York, 1894), which deals in a clear, candid, and yet appreciative manner with this many-sided man. Trollope's life (London, 1880) is also worth reading. Mommsen's enthusiastic admiration for Julius Cæsar was coupled with a corresponding contempt for Cicero, and his prejudiced view had a considerable acceptance for a season. But it has come to be more and more appreciated that those characteristics which aroused Mommsen's scorn constitute the strongest ground for a high estimate of Cicero's nature, and that a man who did what he conceived to be right in the face of full appreciation of the consequences and against the promptings of affection and self-interest is in reality a hero. A very sympathetic treatment is that by Duff in his *Literary History of Rome* (London, 1909), while Ferrero's discussion in his *Greatness and Decline of Rome* should not be neglected.

Cicero must be studied in his environment to be fully understood. For this purpose Boissier's *Cicero and his Friends* (New York, 1898) and Warde Fowler's *Social Life at Rome in the Age of Cicero* (New York, 1909) cannot be too strongly recommended, while the introductions to Tyrrell's *Correspondence of Cicero* (7 vols., London, 1885–1901) contain an immense amount of valuable material for studying his personal, political, and literary relations. Those who are interested in his influence on the literature and learning of subsequent ages will find this admirably treated by Zielinski, *Cicero im Wandel der Jahrhunderte* (2d ed., Leipzig, 1908), while his position in the classicism of the Middle Ages is the subject of Scott's *The Controversies over the Imitation of Cicero as a Model of Style* (New York, 1910). As he was an intimate friend of Cæsar, although his political opponent, all discussions of Cæsar have a great deal to do with Cicero; hence the books referred to in the article on Cæsar should also be cited here.

There have been innumerable editions of Cicero in whole or in part since the *editio princeps* of 1498, but the corpus has been too great for many complete editions in modern times. The editions of Baiter and Kayser (Berlin, Weidmann) and by Friederich and Mueller (Leipzig, Teubner) are the most recent, aside from the Oxford text now in course of publication by Wilkins and Clark which marks a great advance in the criticism of the text. The only complete edition of the *Orations* with English notes is that by Long (4 vols., London, 1851–1858), now partly out of print. But there are numerous editions of individual orations. Of his letters, in addition to the edition by Tyrrell above mentioned, the selection of Watson (Oxford, 1891) is important. The latter has been admirably translated by Jeans (2d ed., London, 1887). Of school editions there is no lack.

There have been a myriad of studies of Cicero's language from all points of view. The most important recent books are Lebreton's *Études sur le langue et la grammaire de Cicéron* (Paris, 1907), Zielinski's *Das Clauselgesetz in Ciceros Reden* (Leipzig, 1904), and Laurand's *Études sur le style des discours de Cicéron*

(Paris, 1907). Complete lexica to his speeches and philosophical works have been prepared by Merguet (Jena, 1877–1894). For the legal questions involved in the *Orations*, Greenidge's *Legal Procedure in Cicero's Time* (Oxford, 1901) will be found valuable. A complete bibliography may be found in the books above cited and in Teuffel's *History of Latin Literature* (translation by Warr, London, 1891; new German edition announced). G. L.

CICERONIANISM. — A term applied in rhetoric and prose style to the standards established by Cicero and exemplified in his works and in the history of education to the exaggerated humanistic tendency of the sixteenth and seventeenth centuries which made the imitation of Cicero's style the chief aim of school work. Two schools of eloquence flourished at Rome in the time of Cicero, the Atticists and the Asiatics. The genius of the great orator lent itself, however, to neither, but freely and independently fashioned a third whose theory is embodied in the *De Oratore*, the *Orator*, and the *Brutus*, where he sets forth the aim of eloquence to be *docere, delectare, et movere;* the means, *Latine, plane, ornate et apte dicere.* The whole is based on general culture, and may be gained by imitation if care is taken to imitate only the virtues of the model. Controversies grew out of the statement of this theory. Brutus and Calvus criticized Cicero's style as redundant and overelaborate. Cæsar wrote *De Analogia* to refute some of the passages of the *De Oratore* relating to the importance and means of obtaining *Latine.* Gallus Pollio wrote against the style of Cicero, and was answered by Suetonius and Aulus Gellius. One, Largius Licinius, is mentioned by Gellius as having written a book entitled *Ciceromastix.* Quintilian stands out as the first great and ardent advocate of Ciceronianism. All his influence at Rome in court and school was exerted to establish a definite system of technique which recognized Cicero as the model. In his *Institutio Oratoria* he follows very minutely the theory of *De Oratore* and *Brutus*, acknowledging his debt to Cicero at every point. We get in the first books the formulation of rules for orthography and grammar based on Cicero's usage. This is the beginning of that phase of Ciceronianism which was destined to control Latin composition in the schools of modern times. Tacitus and the younger Pliny were pupils of Quintilian, and naturally were supporters of the same ideal. Pliny in his *Letters* says that his ambition is to rival Cicero, whom he places above all. Tacitus shows a studied imitation of the master in the *Dialogus de Oratoribus*, which teems with balanced periods and elaborate figures; but in his maturer style he departs from his earlier training and can no longer be called a Ciceronian.

The Church Fathers were divided in their allegiance. The neo-Latin introduced from Africa won many, yet Cicero had some able followers. Minucius Felix was so much of a Ciceronian that he wrote an argumentative dialogue persuading to Christianity without the use of a single Christian expression; Lactantius (*q.v.*) won the title of the "Christian Cicero;" St. Ambrose (*q.v.*) introduced into the Church a manual of ethics based on the *De Officiis;* and St. Jerome (*q.v.*) strove to conquer prejudice by declaring that he had found no contradiction between a Ciceronian and a Christian. During the Middle Ages Cicero remained the model for the liberal art of rhetoric as practiced in the schools; for that division of Capella's *Liberal Arts* (*q.v.*) which deals with rhetoric is mainly based on Ciceronian usage. In the early period of the Italian Renaissance Ciceronianism became a prominent phase of the revival of learning. Petrarch reveled in the marvelous harmony of Cicero's periods before he was old enough to understand the sense, and wept because his father threatened to burn his beloved books. When the complete manuscripts of *De Oratore* and the *Institutio Oratoria* were discovered (*c.* 1417), scholars immediately turned to copying, emending, annotating, and imitating these works. Quintilian was used as the guide in the concrete organization of school curricula, and Cicero became the model for composition. At the University of Padua, Gasparino Barzizza (*q.v.*) lectured on the *De Oratore* and arranged a text for his students entitled *Epistolae ad exercitationem accommodatae* (*c.* 1410), which was but a guide to Ciceronian usage. We have Guarino's testimony that it was through Barzizza that Cicero was loved and studied in all the schools of Italy. Guarino da Verona (*q.v.*) and Vittorino da Feltre (*q.v.*) went forth from the lectures of Barzizza to establish the court schools at Mantua and Ferrara. In the curriculum at Mantua Cicero was emphasized, though other classic authors were studied. Vittorino lectured on *De Oratore*, and is said to have been excelled in his interpretation only by Barzizza. It is fair to say that this school with its spirit, curriculum, and method inaugurated a conception of Ciceronianism which stood for the study of content as well as form, and which therefore was destined to come into conflict with that of the stricter sect of Ciceronians of the sixteenth century. Though Vittorino was the author of no textbooks, two Latin grammars of wide reputation were published by his pupils, a small one based on Vittorino's teaching, compiled by Leonicenus (1452), and the large volume of Perotti (*q.v.*) (1468), which has the distinction of being the first modern Latin grammar. Guarino's school differed in no essential from that at Mantua. Cicero was preëminently accepted as the model for prose composition, being studied first through his *Letters* and later through his rhetorical writings. A detailed description of this school can be found in Battista Guarino's *De ordine docendi et studendi* (1459). Two other educational treatises of about this date may be cited as promoting the Ciceronian ideal laid down by Barzizza and Vittorino: the *De liberorum educatione* of Æneas Sylvius (*q.v.*) (1450) and the *De studiis et litteris* of Leonardo Bruni (1472).

The development of that phase of Ciceronianism which made Cicero the exclusive model of style had reached such proportions toward the end of the fifteenth century that the rational Ciceronians of the type of Barzizza came to be counted as enemies, and the servile imitators were considered the only true disciples. Out of this difference of interpretation grew those famous controversies of Poggio Bracciolini and Lorenzo Valla (*q.v.*), Gianfrancesco Pico and Pietro Bembo, Angelo Poliziano and Paolo Cortesi, as well as that long line of charges and defenses instituted by the *Ciceronianus* of Erasmus. The first of these controversies originated in a criticism of Poggio's diction, which he boasted to be perfect Ciceronian, made by one of Valla's pupils. Valla had been educated at Mantua under Vittorino, but he preferred Quintilian to Cicero, and established a school at Rome (1454) with the avowed purpose of exalting Quintilian over Cicero. Later he wrote his *Elegantiae Latinae Linguae*, in which he pointed out mistakes in Cicero, along with other ancient writers. The quarrel over style was but a minor part of the personal quarrel between the two men, but in the course of his attack upon Valla, Poggio says: " What can be a plainer or more open sign of stupidity than for one to dare to be displeased with Cicero's eloquence and to think that he can improve upon it! No man has ever dared to do this before. Valla, the mad dog, the railing reviler, the wrangling pettifogger, emerging from some hovel, attacks Cicero, whom all acknowledge to be the golden stream of eloquence.". The letters of Politian and Cortesi (1493) form really the first serious controversy on the subject. In this Politian maintains that individual originality is possible, though classical models are accepted, that nothing is more dangerous than this newly arisen superstition, and that nothing is more disgusting than those apes of Cicero; Cortesi defends the proposition that Cicero should be the exclusive model of style because it is foolish to imitate any except the best, and that imitation, as understood by Cicero, is necessary in composition. The letters of Pico and Bembo (1512–1513) are similar in content and argument, though very much longer. Bembo was the preëminent leader of the strict Ciceronians, whose canons of style are well exemplified not only in this letter to Pico, but also in his *History of Venice*, where he calls the municipal councillors *patres conscripti*, the nuns *virgines vestales*, the saints *divi*, and the cardinals *senatores*; in order to imitate Cicero. Sadoleto (*q.v.*), whose name is always linked with that of Bembo when Ciceronians are mentioned, did not follow Cicero so slavishly, and in his *De Liberis recte instituendis* he does not set up Cicero as the only model.

Politian and Pico both preached and practiced their doctrine in Florence, but with only moderate success, for the scholars of Italy were fast yielding to the stricter interpretation of imitation. The University of Padua, which had been the home of Barzizza and that early humanism which sought the spirit of Cicero and not the form merely, had now become the center of the stricter sect. Bembo had settled there. Villanovanus (1527) and Longolius (1522) were professors of rhetoric in the University, and among the students were Reginald Pole, Latimer, and Dolet.

Ciceronianism became a matter of general interest in France and Germany upon the publication of the *Ciceronianus* of Erasmus (*q.v.*) (1528). Before that time Erasmus had criticized the Italian Ciceronians and had been criticized by them, but Europe had given little heed. Erasmus was of the early Italian Renaissance school. He believed in the imitation of Ciceronian form and diction, but he would not subordinate subject matter to form, nor would he use pagan vocabulary in treating Christian themes. When in his *Ciceronianus* he had ridiculed the servile imitators, picking them out and reviewing their faults, he found himself, as he expresses it, " an ass among hornets." J. C. Scaliger (1531) and Étienne Dolet (1535) answered Erasmus, setting forth reasons why Cicero should be the exclusive model, yet denying that the Ciceronians refused to read or to use the vocabulary of any other classical author. Franciscus Floridus Sabinus (1539), M. Antonius Muretus (1556), Petrus Ramus (1556) (*q.v.*), and Henricus Stephanus (1578) continued the ridicule begun by Erasmus.

The zeal of the Ciceronians to use the vocabulary of Cicero resulted in the publication of lexicons, phrase books, commentaries, and rhetorics. Among the most important of these are the *Observations* of Nizzoli, the *Commentaries* of Dolet, and the *Thesaurus* of Robert Estienne, which were used universally as the standard Latin dictionaries for more than a century. Nizzoli's *Observations* was first published in Brescia in 1535. It was afterward edited and enlarged by Basilius Zanchus and Cælius Secundus Curio (Basel, 1548); by Marcellus Squarcialupus (Basel, 1576) and Christopher Cellarius (Basel, 1583) under the title of *Thesaurus Ciceronianus;* by Alex. Scot (Basel, 1588) with the title of *Apparatus Latinae Locutionis;* by Barezzi (Venice, 1606) and Giacomo Faccialoti (Padua, 1734) under the title of *Lexicon Ciceronianus.* There were also abridged editions by Antonius Schorus (Coloniæ, 1578) with a preface by John Sturm (Argentorati, 1580), and one by Aldus Manutius (Francof., 1590). The *Thesaurus* of Estienne, first published in a three folio volume edition in 1536, went through various modifications, but was not exclusively Ciceronian. The *Commentaries* of Dolet (Lyons, 1536–1538) was never so usable because it was not alphabetically arranged. An abridged form appeared in 1585 with a preface by Sturm, which was printed in 1606 as an appendix to the Nizzoli lexicon without credit, and in 1734 with credit.

At the close of the sixteenth century general interest in Ciceronian imitation had more or less died out because of the increase of interest in the use of the vernaculars; yet until well up into the eighteenth century articles on the subject in no small number can be found. Certain it is that all through the seventeenth century Latin formed almost the entire subject matter of the curricula of the grammar schools and that Cicero was considered the final authority in usage and form. This is exemplified by such representative schools as St. Paul's in London, the Collège de Guyenne in France, and the Gymnasium of Strasburg, which, established in the first half of the sixteenth century under the impulse of the Renaissance, held with more or less vigor to their ideal until the scientific and realistic movements in education forced modifications. I. S.

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CINCINNATI, CITY OF. — The second largest city in the state of Ohio, and the leading commercial city of the southern part of the state. Incorporated as a city in 1819. In 1900 the total population was 325,902, and its estimated population in 1909 was 351,212. Its school census, 6–21 years of age, was 89,343 in 1909; and its total school enrollment in day schools was 42,092, and 4418 in night schools. The enrollment in private and parochial schools was 19,183 additional. Of the total population in 1900, 18 per cent were foreign born, and 4.4 per cent were negroes. Of the foreign born, 67 per cent were German and 16 per cent Irish.

History. — Private-venture schools existed in Cincinnati before 1800, and in 1817 a Lancasterian school of similar type was opened. In 1818 John Kidd, a wealthy baker, bequeathed $1000 per annum for "the education of poor children and youths of Cincinnati," but in 1825 the fund was taken from the city by his heirs. Another bequest for the same purpose was made in 1824 by Thomas Hughes.

In 1825 the state enacted a new common school law, which, among other things, provided for "a Board of Trustees and Visitors for the Common Schools" of Cincinnati. This Board, consisting of five men, in conjunction with the City Council, was to levy and collect taxes for and to maintain common schools. The first public school was opened in 1828, with between 70 and 80 pupils. The schools at first met with great local opposition, both from the people and the Council. To awaken public interest, public examinations were instituted and street parades were employed. These were kept up for some years, culminating with the great street parade of June, 1833. The result was that the people were won over to the support of the schools, and bonds were issued in 1834–1835 to build eight new schoolhouses. The first printed school report, issued in 1833, showed an expenditure of $7778 in the preceding year, $175 of which was for premium books for pupils and for banners for the school parades. Each trustee, at that time, selected such textbooks and made such a course of study as he saw fit for his ward, without reference to the others.

In 1837 the Board was enlarged to two from each of the five wards, instead of one, and new school districts were organized. In 1839 schools were established in orphan asylums; in 1840 the German language was introduced into the common schools; in 1841 a special teacher of penmanship was employed, and evening schools for men were opened; in 1844 the teaching of vocal music was begun; in 1846 the textbooks and the instruction in the schools were made somewhat more uniform; in 1847 a central high school, with a graded course of study, was established; in 1849 schools for colored children were established; a law, in 1850, provided for the election of a City Superintendent of Schools by popular vote; in 1851 the Hughes and the Woodward high schools were established; in 1853 the power to appoint the Superintendent of Schools was given to the Board of Trustees and Visitors; in 1854 intermediate schools, in which the two higher grades of the district schools were collected at a central or intermediate school, were organized; in 1855 evening schools for girls were provided, and the school library of Cincinnati was established; in 1856 an evening high school was established; in 1860 physical instruction became a part of the course of instruction; in 1862 drawing was introduced; in 1868 a city normal school was opened; in 1873 the University of Cincinnati was organized; and in 1875 a school for the deaf was organized, which, in 1888, was adopted as a part of the city school system.

By the addition of wards the Board of Trustees and Visitors slowly increased in numbers from 10 in 1837 to 50 in 1873. In 1878 the term " Board of Education " was substituted for the earlier title; and in 1880 the organization was changed to 12, elected at large, and one from each of the 25 wards. In 1887, the members-at-large were abolished. By 1896, through the addition of wards, the Board numbered 31. In 1904 a general state law with reference to city boards of education was enacted, and under it the Board was reduced to 27, 3 being elected at large and 24 from school districts. In 1908 a new state law permitted of the further reorganization of city boards of education, and the Board now consists of 7 members, all elected at large.

The management of the Board of Education for half a century has been careful and conservative, and the tax rate has been kept low. In 1875, the Board was given control of the levying of taxes for schools, independent of the Council. The Board of Review of the city still had power to cut down the levy. For thirty years after this time no marked progress was made. About 1905 a new interest in education seems to have been awakened in the city, largely due to the campaign made by the Citizens' Municipal Party. New buildings were arranged for; a new high school was established; manual training was introduced into the seventh and eighth grades; kindergartens were added to the system; a school for the blind was opened; and a teachers' college was established in connection with the University of Cincinnati. In 1906 medical inspection was begun; and aid was extended to the Vacation Schools, which had been conducted under private auspices since 1899. In 1909 a continuation school for apprentices, modeled on the German type, was opened.

Present System. — The school system, as at present organized, is as follows: the Board of Education employs as its executive officers a Superintendent of City Schools; a Clerk, who acts as business manager; a Superintendent of Buildings; an Assistant Superintendent, and an Engineer; a Custodian of Supplies; and a Truant Officer with 3 assistants. The Superintendent of Schools is elected for a five-year term, the others for two-year terms. A Board of Examiners of 3, appointed by the Board, examines all teachers for certification and qualification. The Superintendent nominates all teachers to the Board for appointment. He is assisted by a supervisor of physical training, with 5 assistants; a supervisor of penmanship, with 5 assistants; a supervisor of domestic science, with 8 assistants; a supervisor of manual training, with 8 assistants; a supervisor of music, with 9 assistants; a supervisor of drawing, with 8 assistants; a supervisor of German with 186 assistants; and a supervisor of kindergartens. The city system includes kindergartens, conducted in connection with a number of the elementary schools; 47 day elementary schools; 3 day intermediate schools; 3 day high schools; special schools for the deaf and for the blind; a continuation school for apprentices; 4 evening elementary schools; 2 evening high schools; and a city university. For these schools the city employed 65 supervisory officers and 1051 teachers in 1908–1909. Of these teachers, 30 were employed in kindergartens, and 76 in high schools, 84 additional teachers were employed in the evening schools. The total cost for maintenance of the schools, not including the University of Cincinnati, was $1,549,343. About 11 per cent of this came from state sources, and the remainder from a city tax of 7½ per cent. The University of Cincinnati (*q.v.*), with collegiate, engineering, and graduate departments, a teachers' college, and faculties of law, medicine, and dentistry, is also partially maintained by the city as a city university, forming the culmination of the public school system of the city. E. P. C.

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CINCINNATI, UNIVERSITY OF, CINCINNATI, OHIO. — Established in 1870 under an act by which the General Assembly of Ohio was empowered to aid and promote education. The academic department was not organized until 1894. An old trust fund was found inadequate, and was supplemented by donations and a public tax. In 1896 the Medical College of Ohio (founded in 1819) became part of the university, joined in 1908 by the Miami

Medical College. In 1896 a Law Department was organized, and in 1897 this was joined by the Cincinnati College Law School. The College of Engineering was organized in 1900. In 1905 the College for Teachers was established in coöperation with the Board of Education of the city. In 1906 a graduate school was organized as a separate department. For admission to the college of liberal arts, schools of law and engineering, candidates must show evidence of preparatory study represented by about 16 units. Certificates from accredited schools are accepted. Candidates who have completed freshman and sophomore years in a recognized college are admitted to the College for Teachers. There were enrolled in 1909–1910 753 students in the college, 223 in the College for Teachers, 203 in engineering, 84 in law, 199 in medicine. There are 86 professors, 5 associate professors, 32 assistant professors, and 100 instructors, demonstrators, and assistants on the faculty. Charles William Dabney, Ph.D., LL.D., is the president.

CIPHERS. — See Notation.

CIRCULATING CHARITY SCHOOLS. — The term applied to the charity schools of Wales, from the fact that the teacher stopped at each town or village for a few months only at a time, and then passed on to another place. For a discussion of this type of schools, see Charity Schools; Wales, Education in; see also Moving Schools.

CIRCULATORY ACTIVITIES. — The muscular activities involved in distributing the blood through the body are intimately related to all forms of emotion. In general the effect of a pleasurable impression is to heighten the circulatory activity and intensify the activity of the heart, while disagreeable experiences tend to restrict the activity of the circulatory organs. The circulatory processes are among the best means of measuring mental disturbances of an emotional type.

See Emotional Expressions.

CIRCULAR INSANITY. — Circular insanity is the name given by some psychiatrists (see article on Psychiatry), to one of the most frequent forms of mental disturbance. It is one of the group of apparently quite different diseases, but undoubtedly of the same cause, course, and outcome. The group to which circular insanity belongs, which includes such apparently diversified forms as simple mania, simple melancholia, and mixtures of these, has been differentiated by Kraepelin, who has given to it the name *manisch-depressive Irresein*, which has been transliterated into English as *Manic-Depressive Insanity*. The symptoms in manic-depressive insanity are grouped in various ways, and to each kind of grouping a separate name is given.

In this kind of insanity the three principal mental symptoms are classed under the following heads: thinking, emotion, will. The abnormalities of a mental order are those of an apparent ease or a difficulty in thinking, those of a marked feeling of well-being or of a state of depression, and those of motor unrest or of a disinclination to move or a slowing of movement. The ways in which these symptoms may be combined, and the variety of the combinations, are shown in the accompanying diagrams. In the figures the dotted line represents the emotional condition or the feeling tone, the broken line the ease in thinking, and the continuous line the character of the acts. Above the horizontal line these mean respectively the feeling of well-being or an exhilaration, apparent ease in thinking, and motor unrest, while below the horizontal line the opposite meaning is given. The horizontal line is taken, as a very artificial standard, as the normal level. The vertical lines separate the curve combinations in such a way that the different forms of manic-depressive insanity are represented in this threefold symptomatic way. All the clinical forms of manic-depressive insanity are given diagrammatically in these curves, and the diagrams show well how one form may merge into another. It should be noted that the amount of deviation of the curves from the horizontal line does not indicate the amount or the intensity of the mental condition or the mental change.

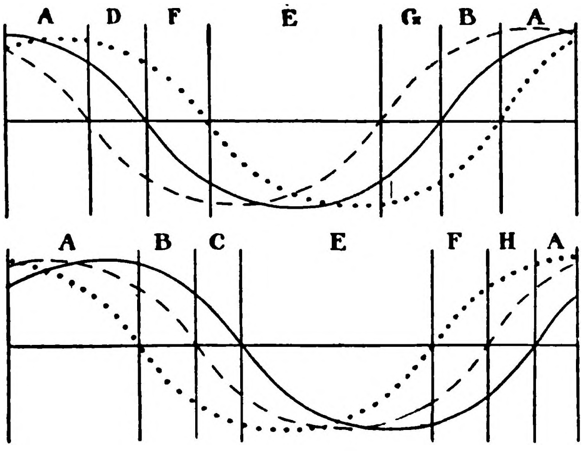

Diagram illustrating the possible combination of the three main symptoms in manic-depressive insanity. From Kraepelin (modified).

Thinking - - - - - Emotion . . . . Will ______

In the diagrams the condition *A* represents the main symptoms found in *simple mania*, while *E* is the representation of the condition in *simple depression* or *melancholia*. *B*, *C*, *D*, *F*, *G*, and *H* represent the so-called mixed states; *B* and *C* represent different combinations in *agitated depression*, *D* represents those in *unproductive mania*, and *F* those in *maniacal stupor*. It is found that while any one form may be recovered from, there is a tendency to recurrence, and that the form in which the disease recurs may be different from the original form. Thus we find individuals in whom one attack of melancholia or mania is followed by a similar attack at an interval of months or years (*recurrent melancholia* and *recurrent mania*), and others in whom there is a regular alternation of maniacal and depressed states, with or without intervening lucid or normal periods between the two forms (*alternating insanity* and *circular insanity.*)

According to Kraepelin from 10 to 15 per cent of all patients admitted to insane hospitals have this kind of insanity, and about two thirds of all cases, and about three quarters of all these cases beginning before the age of 25, are girls and women. About 10 per cent have a first attack before the age of 15, but the greatest number coincides with the adolescent and subsequent growth period, viz., 37 per cent of the admissions (*i.e.* first attacks) occur between the ages of 15 and 20. It will be seen, therefore, that nearly half of the total number of the insane with this form of insanity have the first attack during the period of school life.

In the production of this kind of insanity heredity appears to play a very important rôle, for it has been found that the same or allied forms of mental disease existed in other members of the family in about 80 per cent of all cases. The disease may be initiated by external conditions, mental stress, accidents, bodily disease, etc., but many cases appear to originate spontaneously, and all show a decided disproportion between the reactions (the insanity) and the preceding stress, if that appears to be the cause. A special mental constitution or predisposition is supposed to be present in those who have manic-depressive attacks, and this is shown by the tendency of these patients to get attacks of periodic depressions and excitements which are not sufficiently severe to be called insanity.

The duration of the disease has sometimes been said to be the lifetime, but this can be said only because there is the tendency to recurrence, and because of the mental constitution. Practically all cases have two attacks, the patient being normal, so far as this can be determined, between attacks. The individual attacks greatly vary in duration; some persist only one to two weeks, most are from 6 to 8 months, and a few continue for as long as 2 to 4 years. Real circular insanity, which has been defined above as alternations of maniacal and depressed states without lucid intervals, is incurable and lifelong. The period between attacks of the recoverable forms varies as greatly as the individual lengths of attacks. In early life 1 to 10 years may intervene, while the normal intervening period is usually shorter in later life. On the other hand, it is not unusual to find individuals who after a first attack in youth remain normal until the ages of 40 or 50. So far as is known at present this kind of insanity is not caused by or associated with characteristic anatomical changes in the nervous system, nor is it caused by microörganisms. It is, therefore, called a functional disease. For the characterization of the different symptoms and of the different forms of the disease the reader is referred to the articles on Mania and Melancholia.

Because of the motor manifestations, especially the condition of retardation in depressions, the disease is sometimes confused with dementia precox (*q.v.*) and with feeble-mindedness (*q.v.*). This is particularly true of the cases which occur during the school period. Since, as was noted above, about one half of such patients have the first attack during the period of school life, a knowledge of the disease is important to the teacher, and any abnormalities of children resembling the symptoms of the forms of the disease should be immediately brought to the attention of the school medical examiner. S. I. F.

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(See also bibliographies under Mania, Melancholia, and Psychiatry.)

CISTERCIANS, EDUCATIONAL ACTIVITY OF. — The Order of Cistercians was founded at Cîteaux in the diocese of Châlons in 1098 as an offshoot of the Benedictine congregation at Molesmes. The founder was St. Robert, Abbot of Molesmes. One of the first superiors of the new community was the Englishman, Stephen Harding. The entrance of St. Bernard into the order at Cîteaux in 1112 and the foundation of the monastery of Clairvaux in 1115 led to an extraordinary development and activity not only along strictly monastic lines, but also in the outside world of ecclesiastical affairs, especially in the foundation and promotion of various orders of chivalry, in the suppression of heretical teaching, and in the organization of the Second Crusade. Before the death of St. Bernard in 1181 the Cistercian Order had 343 monasteries; by the end of the fourteenth century the number had reached 700. These were distinguished by the extraordinary sanctity and austerity of their inmates, by the zeal with which they undertook and carried out vast projects for the material improvement of the districts in which they were located, and by the hospitality and charity which, according to the tradition of the Benedictine rule, they practiced without stint. The famous chronicler, Cæsarius of Heisterbach, himself a Cistercian, tells of a monastery in Westphalia which in a period of more than ordinary stringency among the neighboring farmers gave up the last of its stores and even pledged the sacred utensils of the sanctuary in order to relieve the poor.

In the fifteenth century the Cistercian Order entered into a period of decay. This led to several attempts at reform, the most successful of which was that inaugurated at La Trappe in the diocese of Séez by the Abbot de Rancé, who entered the order in 1663. The Trappists, as they are commonly called, revived the austerity and fervor of the primitive Cistercian foundation, and amid many difficulties, including several schisms which threatened to disrupt the organization, maintained the reformed rule until the French Revolution. In the wholesale suppression and confiscation which marked the policy of the revolutionists toward the monastic orders, not even Cîteaux and Clairveaux were spared, and the example of France soon spread to Austria, Prussia, Portugal, and Spain. At present the Cistercians of the common observance have 25 monasteries, and the members of the order number 1015, while those of the strict observance have 71 monasteries, with a total membership of more than 4000 monks. Of these 71 monasteries, 3 are in England, 2 in Ireland, 5 in Canada, 1 in Brazil, and 4 in the United States.

Cistercians in America. — In 1802 Dom Urbain, a native of Nantes, arrived at Baltimore with 24 other members of the Trappist congregation. They settled first in the neighborhood of Baltimore, but moved three years later to the vicinity of Louisville, Ky. There, having been joined by another contingent from France, they set to work to reclaim a tract of land known as Casey's Creek. In 1809, however, they abandoned the tract and moved to Florissant, La. Thence they moved to Monks' Mound, near St. Louis, in 1810. The next year the settlement was abandoned, and the superior, Dom Urbain, transferred a small portion of his community to the neighborhood of Pittsburg. An equally unsuccessful attempt was made during the same period to found a Trappist colony in Nova Scotia. With greater success the Trappist monastery of Melleray in France undertook in 1848 the reclamation of a tract of land in Kentucky not far from Monks' Mound. The new settlement was called Gethsemane; in 1850 it was erected into an abbey by Pius IX. In 1848, also, the Monastery of Mount Melleray in Ireland sent a number of Trappist monks to Iowa, and there, about 15 miles west of Dubuque, was laid the foundation of the monastery of New Melleray, which was raised to the dignity of an abbey in 1862. Besides these two most important foundations of the Trappist order in the United States, there are two others, the Monastery of Our Lady of the Valley, Lonsdale, R. I. (transferred from Nova Scotia in 1900), and that of Our Lady of Jordan, Ore., founded in 1904 by Dom Marchand, with a party of monks exiled from France. The five Cistercian monasteries in Canada are: the Abbey of La Trappe, 30 miles from Montreal, founded in 1881, the Monastery of Lake St. John, founded in 1892, the Monastery of Our Lady of the Prairies in Manitoba, founded in 1892, the Monastery of Our Lady of Calvary, Rogersville, N. B., founded in 1902, and the Petit Clairvaux in Nova Scotia, re-founded in 1903. The only Cistercian foundation in South America is that of Maristella near Sao Paulo, Brazil, founded in 1904.

The Cistercians and Education. — Owing to the influence of Stephen Harding and St. Bernard, both of whom composed works on asceticism, the Cistercian monasteries from the very beginning were remarkable for the spiritual training which they imparted. Mystic theology was a favorite study in the houses of the order, and not only were the recognized orthodox mystics studied, but also, as is clear from an examination of the twelfth and thirteenth century Mss., such writers as John Scotus Eriugena (*q.v.*), who elsewhere was either completely ignored or mentioned only to be stigmatized as a heretic. There is reason to believe that before the appearance of the Albigensian heresy in the first decades of the thirteenth century, the Cistercians had developed in their own monasteries a system of mystic theology which, while thoroughly orthodox, was far bolder on its speculative side than the traditional mysticism of the school of St. Victor. The appreciation of the importance of the spiritual element in education characterizes the Cistercians throughout the whole course of their history. This is especially true of the Trappists, who have adopted the saying of their founder, De Rancé, " The knowledge of Christ crucified is the only knowledge that a Trappist should possess " — a sentiment which was vigorously combated by Mabillon and other Benedictines.

But while the Cistercians thus exalted into highest prominence the spiritual element in education, they did not, in practice, at least, neglect the material and the intellectual. During the twelfth and thirteenth centuries they set the best kind of practical models of agriculture before the farmers of central Europe; in England they contributed largely to the success of the woolen trade, and throughout Europe generally they improved the conditions of traffic. Not only did they pay particular attention to the training of their own candidates in intellectual as well as in spiritual matters but they also built and maintained in or near their monasteries schools for externs. Of their educational work in Hungary in the nineteenth century Heimbucher says, " The History of the Order in that country is the history of education in Hungary from 1816 to 1896." In England, Ireland, and America the larger Cistercian foundations have schools and colleges and are doing very good work as educators. The college at Mount Melleray, Ireland, has distinguished itself during the last 15 years, and counts among its pupils many distinguished ecclesiastics throughout the English-speaking world.

Among the first Cistercians were several distinguished theologians, such as Stephen Harding, St. Bernard, William of St. Thierry, and the famous Alanus of Lille (or *ab Insulis*); historians, such as Otto of Freising, Godfrey of Clairvaux, Gunther the Scholastic, Cæsarius of Heisterbach and Alberic of the Three Fountains; poets, such as Christian von Lilienfeld, and the anonymous monk of Heilsbronn. In the sixteenth and seventeenth centuries the Cistercians continued to contribute to the sacred and profane sciences. The most distinguished of their scholars during those centuries was John Caramuel y Lobkowicz, a man of extraordinary versatility, author of 74 different works on theology, philosophy, mathematics, philology, and natural science. At the present time the order has many scholars of wide reputation, for instance Drs. Neumann, Schneedorfer, Schlögl, and Nagl, who are engaged in university work in Germany and Austria. To the order of the Feuillants, which, like that of the Trappists, is a reform of the original Cistercian institute, belonged the celebrated Cardinal Bona, a seventeenth-century writer on liturgy and ascetical theology. Finally it is worthy of mention that the Trappists who are in charge of the catacombs in Rome have made many interesting discoveries in archæology in recent times. W. T.

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CITIZENSHIP AND EDUCATION. — The relation of education to citizenship is so manifold that the discussion of this relation is divided into a very great number of topics. The fuller formulation of the theory of education for citizenship is given under the titles, Aim in Education; Culture; Course of Study, Theory of; Democracy and Education. For a fuller consideration of the concrete means adopted for developing good citizenship through the schools, see such topics as Civics as a School Subject; Current Events, Teaching of; Economics as a School Subject; History as a School Subject; Industrial Education; Missions, Educational Aspect of Modern; Moral Education; Religious Education; together with the article mentioned above, Course of Study, Theory of. For a discussion of the practical machinery by which various peoples seek to develop good citizenship through the schools, see the article on the systems of education in the various countries. For the consideration of educational attempts to influence abnormal conditions to conform to normal standards of citizenship, see such topics as Defectives, Education of; Defectives, Schools for; Delinquents; Crime and Education; Penology; and all related topics. The following discussion is devoted to the outlining of the very general relations of public school work to good citizenship.

Education of children at the expense of the State is justified only on the ground that it materially improves the quality of citizenship. If the State expends its money for this purpose, it should naturally inquire into the best way of accomplishing that purpose; and this way is in part by changes in the curriculum, more by a change in the teacher's attitude toward his work, with the consequent change in his methods.

I. The Citizen exists for the State. — In order that the child may become, with increasing years, a more efficient citizen and man who can render more and more aid to the State, he needs to be trained so as to develop to the best advantage all his powers, physical, mental, moral, and religious, and then to devote them to the service of society.

1. **Physical Development.** — (*a*) *Economic burden of ill health.* — Until late years so little care has been given to the value of good health from the point of view of the public that little literature exists on the subject. In a late report prepared for the National Conservation Commission by Professor Irving Fisher, the economic value of good health, however, is made emphatic. On a conservative basis it is estimated that, owing to our lack of care of health, there are in the United States at least 630,000 deaths annually, which, with due care, would be preventable or at least postponable; and each postponement would, on careful estimate, save on the average $1700. The national annual unnecessary loss of capitalized net earnings is thus rather more than one billion dollars.

In addition to this Professor Fisher estimates that there are about one million persons in the working period of life who are so ill that they cannot work and yet do not die. Estimating that three fourths of these would work regularly and each normally earn $700 a year, he finds rather more than $500,000,000 as the minimum loss of earnings from enforced idleness caused by illness. We may properly add to this the cost of medical attendance, medicine, nursing, etc., with a resulting annual loss of not less than one billion and a half of dollars, making two billions of loss annually from disease. It is a very conservative estimate that 25 per cent of this, $500,000,000, is preventable. This, added to the loss from preventable deaths, gives a billion and a half of readily preventable waste in this country, provided due care were paid to health. Aside from the question of the prolongation of life and the direct loss from illness should be added the sum lost from undue fatigues and minor ailments that do not require the care of a physician but which do lessen decidedly the efficiency of work. The same careful observer places this loss at not less than $500,000,000. The total preventable loss from death and disease and minor ailments would be not less than $2,000,000,000 annually and is probably two or three times as much. (*b*) *Remedies.* — With these facts and conservative estimates before us, we see how extremely important it is that our schools teach hygiene for the individual in order that through the increased efficiency coming from good health and the added length of the period of efficiency coming from long life of the individual the State may be benefited.

Beyond this care which the individual may be trained to take of his own health, however, is the great advantage to be secured from the specialized training which leads to effective sanitary measures enforced by the state authorities, an enforcement which can be made much more efficient through the hearty coöperation of the citizens trained to know the need of sanitary measures and willing themselves to submit to any personal discomfort that may be required for their enforcement.

2. **Mental Development.** — (*a*) *Enjoyment.* — Next in importance to physical health is the development of one's mental equipment and capacities so as to enrich life. The wider the range of sympathy and taste, the more numerous are the opportunities for the gratification of normal healthful desires and the more frequent and deep the satisfaction. The man who walks through the woods and fields with eyes unopened to the beauties of nature about him, by his knowledge of the nature and process of development of plant and animal life loses almost all of the gratification and satisfaction that comes to him who sees not merely with his eyes but with his understanding. To the man unskilled, untrained in music, the works of the greatest musicians fall on ears that hear not. To the person whose literary taste remains uncultivated, the greatest masters of literature often bring no message more important than that given by the ignorant, sensational reporter of the cheap daily press. Many of the greatest satisfactions in life must come from the education that has awakened desires, trained tastes, and thus prepared one's nature for understanding and enjoyment in fields otherwise not accessible.

Part of the training of the schools is not primarily for personal training, but to furnish tools for further investigation and the means of getting a clearer vision of other fields of learning. A knowledge of languages gives one access to the literature and science of other peoples. Arithmetic and most of the other forms of mathematical learning are keys by which are unlocked the treasure houses of astronomy and physics, and are the tools by which the engineers plan their bridges and factories; while painting and drawing furnish a means of conveying ideas more vividly and accurately than the spoken word.

(*b*) *Service.* — From the social viewpoint, mental training gives one the ability to be useful in society. The skill in craftsmanship of the carpenter and mason and designer is put at the service of the individuals largely to enable them to gratify their social instincts. Our houses furnish not merely shelter for the individual, but also opportunities for bringing one's self into more intimate and more helpful touch with one's fellows. The training given to the artist, to the orator, to the teacher, and the statesman serves not merely as a means of personal gratification, but, what is of still greater importance, as a means by which these promoters of civilization may so work upon their fellows as often to remold or even recreate society.

3. **Moral and Religious Development.** — (*a*) *The Sense of Public Duty.* — Perhaps the basis of moral action most generally accepted as a test by thinking men is the good of society. Whatever action tends toward the social welfare is good. Whatever action tends toward the injury or weakening of society is an evil. It becomes, then, the task of the educator to instil into the nature of the young, the spirit of obligation to the State and to society, the idea of social duty. Only when the mass of the citizens stand ready to place their obligations toward the State before all other obligations, — those to self, to family, to friends, — do we find the best State, whatever its form of government. This sense of obligation toward the State is very generally felt in all civilized communities in times of stress and danger. There is little difficulty in time of war in any nation in securing recruits for the service of armies. The citizens almost to a man stand ready on such occasions to assume the hardships and dangers and sacrifices of military life for the good of the State.

The danger to the State from lack of this sense of public duty is felt not in times of war, but in times of peace. Men who would not hesitate to risk their lives for their country will often thoughtlessly fail to realize their duties of voting or of service on juries or other kinds of the routine work of citizenship, and in their carelessness they often selfishly sacrifice the good of the State to their private interests.

(*b*) *Joy of Service.* — If the training of the youth has been satisfactory, the man not only will feel his duty toward the State, but he will find satisfaction in the opportunity of unselfish service to the State. That only " by toil and tribulation are the ideals of life reached " must not seem too much a hardship. In social as well as in personal relations the essence of devotion is not merely the willingness to render service, but to sacrifice if need be. Service which does not include some element of sacrifice fails often to accomplish the best for the doer even in enjoyment. It should therefore be the aim of the schools to put into the pupil, as far as possible, not merely the sense of obligation to the State, but also the desire to render glad service to society, even though at the cost of great personal sacrifice.

II. Adaptation of the Curriculum. — If a teacher is himself imbued with the spirit of patriotism and the desire to render service to the community of which he is a member, he will have little difficulty in finding material for turning the minds of his pupils in the same direction in many, and perhaps in all, of the studies in the curriculum. And yet of course some subjects contribute more easily to this result than do others. All can be made to help in bridging over the "gap between school and life"; the school must become a real part of life.

1. **Physical Development.** — (*a*) *Hygiene.* — Pupils should certainly be taught in even the early grades the most important simple facts regarding the care of their bodies: the importance of cleanliness, of food suitable in kind and quantity for their needs, the injuries to which they are liable from wrong habits of clothing, the advantages of proper exercise, and the best methods of securing the good effects of the proper use and of avoiding the abuse of narcotics and stimulants. The essential facts regarding the sexual relations and other information bearing directly upon their physical welfare now often withheld, should be given them simply and directly as far as possible before wrong habits of living have become firmly fixed. Beyond the mere information, however, it is desirable that so far as possible the pupils be themselves directly trained and prepared in many ways. Perhaps especially in the lower grades certain forms of exercises that are in themselves interesting, such as marching, dancing, the playing of games that will serve to train not merely their muscles but also to stimulate the spirit of joyousness in their work and play can be given them. Especial care can also be taken in many cases by means of walks and talks and observations upon nature to put the pupils unconsciously into condition for healthy physical development.

(*b*) *Sanitation.* — Quite early also in the school course can be given the elements of instruction that bear directly upon public service. The need of submission to public regulations regarding quarantine in the case of contagious diseases, the desirability of vaccination not merely for personal protection but for the protection of the community, the need of an adequate and pure water supply, and similar subjects can all be explained in such a way as to impress upon the pupils the unselfish character of the best citizenship, while still further discussions regarding the need of taxes to be levied upon the individuals for the establishment of water works, for the upbuilding of a school system, for the making of better roads, can all serve to emphasize the solidarity of interests in the community and the need of sacrifice on the part of the individual to promote the public welfare.

2. **Mental Training.** — (*a*) Personal culture in the studies already mentioned that serve primarily to develop in the pupil new tastes and desires that will tend in later life toward enrichment of living will furnish also the opportunities for inculcating lessons of the higher citizenship. If geography is taught as a study of the earth's surface in its relations to society, the right attitude will normally be assumed. The water courses, in their various ramifications from the mountain rivulet to the broad river alive with vessels carrying the commerce of the nation, will be not merely water flowing through the land, but will become nature's agents watering the lands to make them fertile to supply men's needs, and the means by which through commerce men come into close personal touch one with another so as to satisfy not only physical needs, but also to spread the means of culture and enjoyment from one community to another throughout the land. The beauties of Alpine scenery, the magnificence of Niagara, the awe-inspiring spectacle of a tornado or a storm at sea, have significance for us only in their relations to society and their benefit or injury to mankind.

The study of history or civics or literature should be conducted primarily with reference to the lessons that can be drawn regarding the acts and the motives that have led to benefits to others or to the injury of society, in order that by way of example or of warning the pupils may be led to see the usefulness of history or literature or the study of government toward helping them shape their own ambitions and the plans for their lifework. Even music and art and science, approached from this point of view instead of merely from the viewpoint of physical nature, take on new meanings that make for citizenship.

(*b*) This same element of service may likewise be brought out, although perhaps not so simply or directly, in the study of languages, the elements of mathematics, of chemistry, of physics, that in themselves do not serve primarily toward the satisfaction of a personal desire for the awakening of a new taste, but rather as tools for further study or for the acquirement of a skill that will enable one to render better service. When the study of electricity leads to the establishment of the telegraph and of the telephone, or the knowledge of a foreign language enables one to get into personal touch with other races, or the knowledge of mathematics is thought of as the necessary equipment for planning buildings and bridges and railroads to serve human needs, these subjects likewise assume a meaning for society that at first may not appear.

This is perhaps on the whole the best use of manual training if properly taught. While it serves to give the body exercise and thus to protect the health, while it gives to the hand and eye the training that makes for mental development, it also has a direct aspect of service found in few studies. If a pupil makes a workbox for his mother or a chair for the house or a sled for himself, he sees at once the usefulness of his work for helping others, and that is directly a training for citizenship. Perhaps, too, in no other way can the parents of the pupils who are poor be brought so directly into touch with the schools as through this work. Many children are taken from school to earn money for their parents. If they are learning in the schools skill that seems to have a money-making bearing, whether it be in carpentry or cooking, the parents may well be more ready to leave their children in school for two or three years longer than if their work seems unpractical because non-money-making. The social aspect of manual training is perhaps its chief element of value.

3. **Moral Development.** — In addition to the mental understanding of the social bearings of the studies taken up in the schools, the pupil should acquire as far as possible the spirit which will lead him to be ready to make a sacrifice cheerfully for the good of others. No material change can be made in the subjects of the curriculum that will bring about this result, though some little direct work in moral training might be given. If it is to be reached at all, it will come about primarily through the personality of the teacher and his ability to show the interdependence of human beings one upon the other, the opportunities for service, and the lessons taught by the feelings of the world toward those who have rendered service. This spirit of service may then normally be taken as an ideal toward the attainment of which one may wish to strive.

Moreover, besides this attitude toward one's obligations, there may be given in many instances an opportunity for the practice of citizenship. Habits of courtesy toward teacher and fellow pupils, consideration for the rights and happiness of others, team work, and the administrative subordination that inevitably comes from such work in play or school, attention toward keeping the buildings and school grounds and streets neat and orderly for the public good, even at times the direct practice of some philanthropic service, may well place the pupils far on the way toward the better citizenship. Of course the higher pupils can be given information regarding the form of government, not merely through books, but by visiting meetings of the city councils, noting the work of the nominating conventions or caucuses, seeing how the voter casts his ballot, observing the work of the mayor, the superintendent of streets, and other public officials, and by other methods that will serve to show some of the more public duties of the citizen. For older pupils the same lessons can be taught through the form of school government, the school city, or some similar device. But the most essential point is not the form but the spirit — the attitude of the citizen toward life and toward his fellow-men. Practically every study of the curriculum can call the pupils' attention in that direction, but only the personal influence of those whom the pupils recognize as having natures wiser and stronger and better than their own, with the opportunities for acquiring habits of service, can go far toward inculcating this spirit of personal sacrifice for the public good. With this personal influence the teacher may go far toward building up in the students not only the ideals, but also the practice of citizenship. J. W. J.

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CITY BOARDS OF EDUCATION. — See City School Administration.

CITY BOARDS OF EXAMINATION. — See Examination Boards.

CITY NORMAL SCHOOLS. — See Normal Schools.

CITY COLLEGES. — See Municipal Colleges and Universities.

CITY SCHOOL ADMINISTRATION (United States). — **The Problem.** — The word "city," broadly signifying as it does an aggregation of population within a comparatively small area, includes objective situations and social conditions of wide variation. New York City, with its population of 4,500,000, and Chicago with its 2,000,000, obviously have needs and problems vastly unlike the community of

4500 or that of 2000. Yet, according to the modern official standards of classification, the concentration of a few thousands of persons entitles to the designation of *city* as much as tens of thousands, or hundreds of thousands, or thousands of thousands. While differences in numbers alone render difficult either accurate description or definite generalizations of municipal organization and function, differences in physical and industrial environment, and in the moral, intellectual, and sociological character of populations are factors of even greater importance in defining the organized political and social activity of the modern city. Especially important are these factors in qualifying the relations of the city in the performance of its functions as regards education. Due consideration must also be accorded the different legal positions assigned to the city in the several states.

By common usage the term " school administration " has come to comprehend the entire range of operation of the controlling and directive agencies, as well as the form of organization, of public education. Not only is it employed to signify those features of school control which may be properly classified as administrative, but also those which relate to supervision, inspection, and management. Even though the lines of distinction between these several features are not always easily determined, each to a greater or less degree denotes a particular class of activities, the essential and specific characteristics of which are being more generally recognized. With these limitations, " city school administration " will be assumed here to include a generalized description of the means and methods for the organized control of public education under typical urban conditions.

The form, character, and manner of operation of the administration of public education in American municipalities are the composite results of five principal influences: (*a*) the American social theory of education as a function of the State, (*b*) the political relationship of the American city to the American state, (*c*) the democratic ideal of civic and institutional control, (*d*) the urbanization of population, especially during the last quarter of a century, (*e*) the extension and development of the function of public education.

In theory, as well as in practice, public education in the United States is considered as a direct function of the individual states. The educational system, however differentiated, and to whatever extent adapted to meet special conditions, is organized with the state as an independent and dominant administrative unit. Local areas of administration (district, township, county, city), to the extent that they are in immediate relation to the public school, are considered as but agents of the state in carrying out the state policy. All special and higher institutions for public education are normally held to occupy a similar position. This doctrine has been incorporated to such an extent in the fundamental and statutory law of the different states, and has been enunciated so frequently by the highest courts, as to become one of the fundamental principles of American educational control. Education is a matter of concern to the people of the state as a whole, and is not one primarily for the satisfaction of local needs. Obviously and naturally, this principle has operated as an exceedingly important factor in the development of municipal systems of public schools.

The marked tendency in government for the last three or four decades has been to bring the city more and more within the direct administrative control of the state. The city could not, if it would, live unto itself alone. Every city is a potent influence upon the political, economic, and cultural standards of its environment; and more and more the welfare of the city is reflected in the welfare of the state, as a greater and greater proportion of the population of the state becomes concentrated within urban communities. The original nominal legislative control which the state formerly exercised over the city has been and continues to be transformed into administrative control more or less direct. The state has succeeded in obtaining a double hold upon the city in so far as education is concerned, one through the state organization of the public school system, and one through the subordination of the city in the exercise of its functions as an agency for government.

Nevertheless, the problems of government of the city are radically different from those in nonurban areas. The methods and governmental devices of the latter are not suited to the conditions of the city. Hence the state has been compelled by the force of circumstances to legislate with reference to the peculiar and particular needs of urban populations. The political problem of American educational control has been to develop a high degree of efficiency in the public school system, and at the same time preserve to the people of local communities such a degree of autonomy and freedom for participation as will encourage initiative and fix responsibility. To keep the public educational system of the city democratic and at the same time safeguard it from inefficiency; to preserve it from state bureaucracy, and at the same time protect it from exploitation by party and partisan political influences, represent the constant problems of city school administration. The experiences of American cities have demonstrated beyond a single doubt that only through nonpartisanship of control is effective and disinterested school administration possible. The public school is *for* and *of* no class, and therefore citizenship, without reference to political affiliation, economic conditions, cultural standards, religious belief, or sex, should provide not only ample opportunities for participating in the government of the school, but also responsibilities for such participation.

The problems of municipal government, in a large measure similar under all circumstances, differ widely. The metropolitan city is comparable to the city of a few thousands only in minor particulars. The rapidly expanding and changing urban community contains factors which are not to be found in an older and slower growing community. All in all, it may be said that the majority of the problems of school control pressing for solution at the present time are due in a large degree to the concentration of a diverse population within comparatively small areas and the consequent necessary adaptation to newer economic, physical, moral, and cultural conditions. The rapidity alone with which population has become aggregated in cities (for those of 8000 and over the proportion of the total population rose from 12.5 per cent in 1850 to 16.1 per cent in 1860, to 20.9 per cent in 1870, to 22.6 per cent in 1880, to 29.2 per cent in 1890, to 33.1 per cent in 1900, and to over 40 per cent in 1910) would make necessary a reconstruction of the foundations of municipal social control. Democracy in government receives its first real test in the modern city, and ingenuity for popular government is taxed to the utmost to supply the devices which shall permit the city and efficiency to be developed side by side.

The final determining factor of the municipal school control arises from the large extension and rapid increase in the number of activities of the public school system. Kindergartens, elementary schools, secondary schools of different sorts, playgrounds, night and continuation schools, evening lectures and schools for adults, higher and professional institutions, schools for defectives, dependents, and delinquents are typical of the grades and institutions of education that already belong to the school systems of the larger and more progressive municipalities. Free textbooks and supplies are followed by a proposition for free meals; compulsory attendance laws and child labor prohibitions by demands for school scholarships. Each new educational activity means the assumption of additional municipal responsibility and the presentation of new complications for school administration.

General Organization and Administration. — *Boards.* — The relation and special powers of the city in the performance of its functions pertaining to education are defined by the general provisions of the state law governing the public school system, or by the special provisions of the municipal charter. The chief authority for the direct control of public education is a body of citizens known variously as the board of education, school board, school committee, board of school directors, board of school trustees, board of public education, board of public schools, board of inspectors, board of school controllers, or board of school commissioners. The term "board of education" is most generally used, although for numerous reasons the term "board of school control" is to be preferred. Depending upon the relations borne to the municipal government, the school systems of American cities may be divided into two general classes, the departmental and the autonomous. To the first class belong those which are considered as departments of the city government; to the second class belong those possessing corporate existence separate and apart from the municipal corporation. In but one city of importance (Buffalo) are the public schools under the immediate and exclusive control of the general governing authority of the city (city council). In this city a special committee of the members of the council acts as a board of education.

Two principal methods obtain for the selection and appointment of boards of education, popular election and appointment. Seventy-five of the 100 chief cities of the country choose members of the board by popular election, either from wards or districts (Detroit, Louisville, Providence, Salt Lake City), or at large (St. Louis, Boston, Cleveland, Minneapolis, Indianapolis, Kansas City, Denver, Seattle). The method of election by the people obtains in nearly all cases of autonomous organization, *i.e.* where the school corporation is largely independent of the municipal corporation. In 16 of the chief cities, the members of the board are appointed, generally by the mayor, with or without confirmation by the council and from the city at large or by wards (New York City, Baltimore, Chicago, San Francisco, New Haven). In Philadelphia the members of the board are appointed by the judge of the court of common pleas, and in Washington by the Commissioners of the District of Columbia. Nine cities have some special method of selection, such as Buffalo, previously mentioned; Charleston (S.C.), 6 of the 10 members elected and 4 appointed by the governor of the state; Savannah (S.C.), 9 of the 12 members self-perpetuating, and 3 chosen by the mayor; Pittsburg, 45 members elected by local boards, existing in each of the districts into which the city is divided; New Orleans, 12 members appointed by city council and 8 by the governor. In a number of cities having the departmental form of organization the mayor or some other representative of the municipal government is a member *ex officio* of the board.

The number of members composing the board varies greatly, from 3 in Troy (N.Y.), Albany (N.Y.), and Fort Wayne (Ind.) to 45 in Pittsburg, 46 in New York, and 90 in Allegheny (Pa.). At the present time 56 boards of the 100 largest cities of the country have 9 or less members, 25 have 10 to 15 members, 15 have 16 to 20 members, and 4 have 30 or more members. There has been a marked tendency in recent years to reduce the number of members of the board. Typical instances of such reduction are Boston, 24 members to 5; Rochester, 16 to 5; Baltimore, 29 to 9; St. Louis, 21 to 12; Indianapolis, 11 to 5; Milwaukee, 21 to 15; Newark, 32 to 9. The chief argument for the smaller board has been to facilitate action, to increase efficiency, and to center responsibility. The evidence from numerous recent experiences is conclusive that the small board brings into the school administration more effective and higher types of individuals, is more responsive to educational needs, and is less subject to the influence of party or partisan politics.

Boards of education are lay bodies, and, beyond the requirements of being an elector, special qualifications for membership are not usually imposed. In a number of instances, however, charters and general state laws contain provisions as to age, duration of residence, payment of taxes, and the holding no other public office. As a general rule, women are eligible to school board membership in northern and western cities, and may become qualified voters at popular elections for members. The term of office varies from 2 to 7 years, the tendency being for a term of 3 years. No compensation for service is the uniform practice. Conspicuous exceptions to this are San Francisco, where each of the four members receives an annual compensation of $3000, and Rochester, where members receive $1200 each as an annual salary. A recent act (1907) of the Ohio legislature authorizes boards of education to set aside a fund of 5 cents per pupil in daily attendance to pay expenses of members. Nominal compensation is provided for in certain classes of cities in Utah, Montana, and Indiana. The temper of the people seems to be opposed to compensation under these circumstances, which are considered as a rare opportunity for individuals to render an unselfish social service.

In so far as experience may be a guide, it may be said that the most effective plan of organization of a municipal board of education includes provisions for a small unpaid board, composed of an odd number (5, 7, or 9 to 15, in metropolitan cities) of representative citizens, possessing qualifications defined by law, elected or appointed from the city at large, without reference to partisan affiliation or influence, for a relatively long term but in such manner as to secure gradual renewal of membership. Provisions for the removal of members for neglect of duty or malfeasance of office are also recognized as desirable.

In addition to the board of education there are, in a number of cities, other boards exercising authority over special activities or institutions. The more important of these special organizations are boards for the examination and certification of teachers, boards of management of teachers' retirement funds, schoolhouse commissions, library boards, and boards in charge of special schools (industrial schools in particular) and higher institutions (College of the City of New York, University of Cincinnati). Local boards of education representing sections or districts exist in some cities. Excepting a few instances in Pennsylvania, the functions exercised by these local boards are unimportant. In New York City 46 of these local boards exist, one for each of the districts into which the whole city is divided. Each board is composed of 5 persons appointed by the president of the borough, one member of the board of education designated by the president of that board, and a district superintendent of schools. These local boards have a variety of powers, acting chiefly, however, in an advisory capacity to the board of education in matters relating to school accommodations and discipline.

Powers and Duties. — The powers and duties of boards of education differ in the widest degree. In some instances the general state laws or special charters prescribe in minute detail the authority of boards; in others the state gives a broad grant of power under which boards are permitted to exercise much initiative and great freedom. Generally speaking, the more important direct authority and responsibility are concerned with financial support, physical accommodations and equipment, examination, certification, appointment, and dismissal of teachers, and the establishment, organization, and classification of schools. The history of American boards of education displays certain tendencies and movements relating to the character of the functions performed. When, in the evolution of local government, the board of education came to be firmly established, practically all of the powers of local school control rested with this board, under such general prescriptions as were indicated by the state. Within these prescriptions, the board, as a unit, legislated and executed through its own officers — president, secretary, auditor, etc. — and performed all the general and specific duties of school control. As the public school system expanded and developed, and as the conditions of school control under urban circumstances became more complicated, the necessity for a division of administrative labor easily arose. This was first met through the organization of the membership of the board into special committees, to each of which was assigned, under the direction of the whole board, the performance of special duties. This committee form of organization represents the first stage in the separation of the legislative and executive functions of the board. As the expansion and development of the school system progressed with the growth of the city, and as the complications resulting from the widening sphere of public education increased, a second stage was gradually reached. The number, importance, and activity of the special committees was diminished, and the professional and executive activities of the board were little by little delegated to various trained and expert officers, while there was reserved to the board the power of general legislation and advisory control. The unmistakable tendency in municipal school administration has been to increase the number of these professional agents who, while directly responsible to the board of education, are nevertheless granted large independence of action and are protected from personal and partisan interference. The first of such officers to be accorded a place in the administrative scheme was the city superintendent of schools. Next followed the director of business affairs, superintendent of buildings, medical inspector, etc. Each of these officers is a product of the continued differentiation of function of the lay board of education and of the constant division of labor incident to the effective performance of the several expert executive duties.

The Superintendent of Schools. — This office, the most important of the professional and expert offices of municipal school administration, was the first to develop. Several cities claim the distinction of having first provided for such an officer. Buffalo (1837), Louisville (1837), St. Louis (1839), Providence (1839), Springfield (Mass.) (1840), New Orleans (1841), Rochester (1843), Columbus (Ohio) (1847), Syracuse (1848), Baltimore (1849), Boston (1851), New York (1852), Jersey City (1853), Brooklyn (1853), Cleveland (1853), and Chicago (1854) belong to the first group of cities in which a superintendent of schools is found. Practically every city to-day has a superintendent of schools. The report of the Commissioner of Education of the United States for 1909 contains a list of 1325 such officers in cities having a population of 4000 or more. He is, with one or two exceptions, elected by the board. In Buffalo and San Francisco he is elected by popular vote. In the larger cities, and in those cities possessing a highly organized school system, the exact status of the superintendent of schools and his relationship to the board of education are clearly defined. In the great majority of cases, however, the city superintendent has an uncertain legal status, and his position is determined altogether by the board to which he is responsible. The term of office ranges from one to six years, the longer term being found only in the larger cities. There is a tendency toward a three-year term. Frequently he holds office for an indefinite period at the pleasure of the board. While practically all of the superintendents of schools are men, there are a few instances, one of them notable (Chicago, 1909), in which this office is held by a woman. The annual compensation varies from an amount, merely nominal, and not much above that of an ordinary teacher in smaller cities, to $10,000 in Chicago. In 1903 the superintendents of schools in 14 of the 100 largest cities of the country received an annual salary of $5000 or more; in 15, $4000 to $5000; in 35, $3000 to $4000; in 35, $2000 to $3000; and in one $1000 to $2000.

Theoretically the superintendent of schools is the educational expert of the board of education. To him is delegated the immediate oversight of, and responsibility for, the conduct of the educational work. He is, as he is very properly designated in some communities, the superintendent of instruction. Under his direction are assistant superintendents, supervisors of special subjects, directors of special activities, principals, and teachers. He should be responsible for the selection, assignment and promotion, and dismissal of teachers, for the definition of the guiding principles of instruction, and for the establishment of educational standards. The evolution of school control for half a century has been to elevate the professional standards of fitness for this officer, and to remove him, in his sphere of legitimate activity, from the influence of those forces that aim to subordinate the school system to personal or political ends. The chief obstacle to reform and efficiency in the administration and supervision of city school systems is the absence of a sufficient number of properly qualified technical experts in education to act as superintendents of schools, the lack of standards of qualification, the insecurity of tenure, and the inadequate compensation for the office, in combination with the lack of independence of action in strictly professional matters.

General Business Administration. — Originally the superintendent was the only expert executive officer of the city board of education. As such, his duties covered the entire range of administrative and supervisory control. By and large, this is the position at the present time of the considerable majority of city superintendents. The movement of school control, however, is toward a further differentiation of the executive function so as to separate the business and material administration from the educational administration. This movement has resulted in the establishment in the larger cities of a second expert executive officer, known variously, in accordance with the scope and character of his function, as the school director or business manager.

One of the early and radical measures for this separation of the two principal features of school administration was in operation in Cleveland between 1892 and 1904, and generally known as the Federal or Cleveland Plan (*q.v.*). A school council of seven members, elected at large, was given legislative power over the school budget and school property, and the determination of the general policy of the school system. An officer, known as the School Director, receiving an annual salary of $5000, was also elected by the people. The school director devoted his entire time to the executive duties on the financial and physical side of the administration, and possessed the power to veto acts of the board. He also appointed the superintendent of schools, who was responsible to him. The superintendent was given sole power to appoint and discharge all principals and teachers. In 1904 under a general state law the school council became the board of education, the school director the business manager, and he, as well as the superintendent of schools, became responsible to the board of education and was appointed by it. Typical existing illustrations of school organizations providing for expert business administration are found in Indianapolis, where the board of education elects for a term of four years a business director who serves as the executive officer of the board and who exercises administrative control over all expenditures, contracts, buildings, grounds, supplies, and appoints and discharges all employees of the board, such as janitors and engineers. A somewhat similar plan is found in St. Louis, where, in addition to the superintendent of instruction, a commissioner of school buildings, a secretary and treasurer, an auditor, and a supply commissioner are provided for. (See Business Management.)

Financial Administration. — No single item of the budget of local administrative areas approaches in amount that for public education. Usually, from one quarter to one third of the annual total ordinary expenditures for public purposes in American cities is for public schools. In spite of the large amounts expended, both absolute and proportional, the characteristic financial condition is one of inability to meet the ever-increasing demands. No problem in public school administration in cities equals in importance that of providing a sufficient support. Progress and development are more dependent upon this factor than any other. The wise and efficient control and expenditure of public school funds, as well as the means for their increase, are matters not only of vital significance in educational economy, but in general social economy as well.

Some of the more important features of the relation of the State to education in general, and to the school city in particular, are displayed by an analysis of the financial situation as it relates to public education under typical municipal conditions. There are three major sources of ordinary school support: (*a*) permanent state school funds; (*b*) general state taxes; (*c*) local taxes. In but few states is the first of these important as a factor in the municipal finance. The second is a form of compulsory local tax. The revenues derived are usually apportioned on some basis which assumes to equalize the burdens and benefits of education. In operation, this apportionment usually results in benefit to little urban districts. Consequently, the third, the local property tax, becomes the main source of revenue. Here again cities may be divided into two classes: those in which the boards of education control (within limitations imposed by the state) independently the raising and expenditures of the funds necessary to carry on the educational activities under their charge (St. Louis, Indianapolis, Denver, Cleveland, and Pittsburg); those in which the boards of education are treated as departments of the general municipal government and must submit their estimates for approval and revision to the authority of the municipal government (board of estimate and appointment or council) which ultimately determines the budget (Chicago, San Francisco, Milwaukee, Louisville, Providence). Very frequently, in the cities belonging to the first group, a maximum annual tax, and in some instances a minimum tax, is provided for by the general state law or in the charter. The quite uniform judgment of experts in municipal and educational administration is that boards of education should be authorized to levy a tax rate, within the limits prescribed by law, which should not be subject to review or revision by any other body.

The issuance of bonds for buildings, grounds, and public improvements has, under the stress of the growth of the city, likewise developed into a larger problem of public finance. Usually the maximum amount of such bonds, based on a certain percentage of the taxable property, and the conditions for their issuance, based upon approval by electors or some supervisory body, are accurately prescribed by the law of the state or by the municipal charter. The immediate supervision and management of the financial affairs over which the board of education exercises control is being gradually transferred to the Business Manager or Director, as he is frequently styled.

Buildings and Equipment. — The provision of adequate, sanitary, adaptable, economical and artistic public school accommodations constitutes one of the most important aspects of municipal school administration. Financial resources, hygienic requirements, educational needs, and cultural standards center, as it were, in the school equipment and environment. Here a third differentiation of the functions of the board of education is being accomplished. In addition to the superintendent of schools and the general business and financial manager, a third expert — the superintendent of buildings and grounds — is being given a place. The exact status and relationship of this officer have not yet been clearly defined in the general municipal policy. However, whether designated as superintendent of buildings and grounds, supervising architect, or commissioner of school equipment, the general administrative principle of specialization obtains. The former, and still quite usual, practice of actual administration and executive control of buildings, grounds, equipment, and material supplies by clerical employees or committees of the board is being gradually superseded by one that recognizes the economic and educational necessity of control and direction by experts having an appropriate technical training. Boston, since 1901, affords an interesting illustration of a special schoolhouse department, composed of three commissioners appointed by the mayor. This schoolhouse department exercises a most complete power and authority relative to the selection of lands for school purposes, the making, altering, and approving designs and plans for school purposes, and the erecting, repairing, furnishing, and preparing yards for schools.

State Relationships. — In the exercise of its functions as the agent of the state, the city, in the main, acts through its own boards and officers, and under legislative sanctions. Not infrequently the city is to some degree subject to state and county boards of education, state and county superintendents, state and county boards of examiners, textbook commissions, high school inspectors, and factory inspectors. (See articles on ATTENDANCE, COMPULSORY, and CHILD LABOR.) As a general thing, though, any direct authority of the state is delegated, and operates indirectly as regards actual control and administration.

Professional Administration. — All of the machinery of organization and the externals of the public school system exist primarily for the purpose of effectively accomplishing specific educational aims. The superintendent of schools and his professional associates — assistant superintendents, principals of elementary, secondary, and special schools, teachers and supervisors of special subjects (music, drawing, nature study, manual arts, etc.), directors of special activities (vacation schools, recreation centers, playgrounds, evening schools, *qq.v.*), and classroom teachers — constitute the professional organization. The centralizing tendency in all school administration has resulted in the necessity of such reorganization within the professional force as would increase the importance of the individual unit. School programs, courses of study (*q.v.*), selection of textbooks (*q.v.*) and apparatus, and the determination of standards have come in the well-administered and well-organized municipal school systems to be regarded as matters belonging, not to the lay inexpert administrative body (board of education), nor to any single bureaucratic head, but to the entire body of the professional administration acting coöperatively. The external authorities and mutual relationships of the individuals comprising this professional administration is no longer a significant item in general school control. The chief problem is to organize and at the same time democratize the teaching force of the schools of the modern city.

Competent professional administration means properly educated and thoroughly trained teachers. As a general rule city school systems are authorized to establish higher standards for the teachers and professional officers than those operating generally in the school system of the state. Frequently special boards of examiners are created for this purpose in the city. A merit plan of appointment and promotion is being gradually adopted and developed by progressive communities. Permanency of tenure, graduated compensation scales, and retirement funds are serving to bring to the service of the city the best of the talent and to stimulate it to that form of activity that will produce that degree of educational efficiency demanded by the conditions and circumstances of urban life.

Coöperation in Administration. — The characteristic tendency of public administration has been toward the centralizing of authority in the hands of a responsible few. The trend of a quarter of a century in public school administration has exhibited this tendency in a marked way. Nevertheless, public education stands somewhat apart from other activities subject to direct social control. Popular interest is for self-evident reasons a vital factor in its welfare and progress. To organize public sentiment in the support of plans for improving public schools of the city and to afford avenues for indirect participation in the work of school control are the aims of numerous clubs, associations, and independent committees of citizens. Woman's clubs, civic improvement societies, public education associations, parents' associations, and commercial clubs are types of extra-legal organizations which are supplementary to boards of education, and which exercise a growing and potent influence in directing and developing the work of public school systems in cities. They may be regarded as a necessary element in the construction of a social institution which is at once democratic and efficient. (See articles on the leading cities.)

E. C. E.

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The literature dealing with the administration of city school systems, while extensive and important, is widely scattered throughout official reports and in contemporary periodical publications. There is much need of sifting, analyzing, organizing, and interpreting this body of material.

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CITY SCHOOL BOARDS. — See City School Administration.

CITY SCHOOLS, BUSINESS OFFICER. — See Business Management and Manager.

CITY SCHOOLS, LOCAL BOARDS. — Historically, local school boards belong to the earlier stages of the development of a system of city school administration. In the beginning each town or city was either only a country school district, governed by one Board of School Trustees, and new districts were later organized and then united into a loose form of a city system; or in the first establishment of the schools of the town or city the conception was that of a series of New England school districts grouped together, rather than that of a unified town or city school system. The latter was the more common form, and was a somewhat natural conception. Seventy-five years ago the schools in the cities were ungraded district schools, and practically independent in textbooks, methods, and plan. One teacher taught the pupils through most or all of the grades, schools in the same building were parallel rather than related, there were few courses of study in print, the interest in both schools and teachers was narrowly local, and the schools in different parts of a city were district or ward schools rather than a part of a city system.

Under these conditions a series of ward or district schools, with ward or district control, was much more natural than a unified city system with central control. A central board of education, with oversight over all schools, was not at first provided for in a number of cities, but was soon made necessary by the unavoidable interrelations between schools, the development of higher schools, and the necessity of regulating taxation and expenditures. The local ward, or district, boards were elected by the people of the ward or school district; and either an independent central board was established for the city as a whole, as in Chicago, or each local district board was given representation in a central board of education, as in Philadelphia.

Many cities which once had this combined plan of local control and central oversight later abandoned it. Chicago, for example, in 1835 organized its schools under a special law after this plan. A central Board of Inspectors were to be elected by the people, who were to examine teachers, select textbooks, and visit schools. In addition, each city school district was to elect, annually, a district school board of three trustees, who were to employ the teachers for the district, see that a sufficient number of schools were maintained in the district, and to levy all taxes for support of the schools of the district. The system proved inefficient, progress everywhere was impeded by the district system, and in 1857 the district organization was abandoned and a central organization was substituted in its place.

In certain Pennsylvania cities the local board idea has persisted long after its general abandonment elsewhere. In Allegheny, Philadelphia, and Pittsburg good examples of the district system may be found. In Allegheny there are 15 ward boards of 6 members each, elected by wards for three-year terms. The 15 ward boards meet together as a central body of 90, and the ward boards also meet by wards. The ward boards have authority to purchase lots; to erect and repair buildings; to purchase apparatus, books, fuel, and supplies; to pay janitors; to borrow money; and to levy taxes to pay interest and principal on indebtedness. To the central board, known as a Board of Controllers, is given such educational and financial functions as are not entrusted to the ward boards. In Philadelphia and Pittsburg there are 37 district boards of directors, of 13 each in Philadelphia and 6 each in Pittsburg; and also a central school board of 37 members. In Philadelphia the members of this central board are appointed by the judges of the Court of Common Pleas, while in Pittsburg they are elected, one from each ward, with *ex officio* membership in the ward boards. At one time Philadelphia and Pittsburg both had federated central boards, similar to Allegheny, of 500 members in Philadelphia and 234 members in Pittsburg.

The local board system has everywhere proved to be inefficient, and incapable of properly and promptly meeting educational needs. The time consumed in committee work and in transacting the simplest business; the educational and business confusion resulting from such a decentralized system of management; and the local, personal, and political basis of membership on the boards and of the controlling school policy, were such as to lead to the somewhat general abandonment of the plan. It is only as the cities have gotten out from under the incubus of such a system that real educational progress has become possible. The tendency to-day is distinctly away from such a system, and toward an efficient centralized and businesslike system of school administration, with definite fixing of responsibility and power. (For a more detailed statement as to tendencies and guiding principles, see the articles on CITY SCHOOL ADMINISTRATION.)

Within recent years, due largely to the very rapid growth of cities and the highly centralized system of school administration which has seemed necessary to secure results, a new movement for a restoration of a form of local or district boards has manifested itself. The argument for such boards is that the people may thus visit and inspect the schools in a semi-official capacity; may have a means of meeting and expressing themselves on questions of finance, discipline, sanitary arrangements, and educational policy; and that the people may consequently be led to take a larger and a deeper interest in the schools. The unit proposed is usually a group of city schools, and not the political ward. The city is to be districted by groups of schools; and the board of education or the mayor is to appoint, or the people are to elect, a certain number of resident inspectors, or commissioners. It has usually been proposed to add the district school superintendent to the board, at least in an advisory and explanatory capacity. The proposed Boston charter of 1898 provided for such boards, under the name of Visitors; the Greater New York charter of 1898 provided for the appointment of such inspectors; and the Chicago Educational Commission of 1899 proposed the creation of such resident commissioners for Chicago. In effect the plan is a revival of the New England school visiting committee idea. There is little need for such a system of local educational bodies in any except large cities, and the results obtained under them so far would not indicate that they have been very successful. Fewer proposals are made for their establishment to-day than was the case ten years ago.

For more detailed information see the special articles on the city school systems of ALLEGHENY, CHICAGO, PHILADELPHIA, and PITTSBURG. The plan for local advisory boards was discussed in the *Report* of the Chicago Educational Commission (*q.v.*), pp. 139–143.

E. P. C.

CITY SUPERINTENDENT OF SCHOOLS. — See CITY SCHOOL ADMINISTRATION.

CITY TRAINING SCHOOLS. — See NORMAL SCHOOLS.

CIVICS. — The term "civics" is now generally employed to refer to the teaching of civil government in our elementary and secondary schools and in colleges. The term "civil government," which was formerly very commonly used for describing this study, has been abandoned, because in its interpretation it was usually narrowed down to a study of the mere framework of government. The word "civics" is said to have been introduced by Henry Randall Waite (see *Standard Dictionary*), and has the advantage over the term "civil government" in that it is now generally understood to include: (1) ethics, or the doctrine of duties in society; (2) civil polity, or governmental methods and machinery; (3) history of civic development and movement.

Like most subjects outside of the three R's in the elementary school curriculum, and the classics and mathematics in the secondary school course of study, the subject matter of civics was not taught in schools until some years after the middle of the nineteenth century. In the year 1859 Daniel Read of Wisconsin read a paper before the National Teachers' Association (after 1870 known as the National Education Association) on *The Importance of Civil Polity as a Branch of Popular Education.* In 1863 a committee of the same association made a special report on the teaching of the principles of government in the schools. In 1869 the following resolutions were passed: "That the National Teachers' Association considers it a part of the duty of all institutions of learning to inculcate the principles of an intelligent citizenship, and to this end they earnestly recommend the more extensive introduction into our public schools of the study of United States History, especially with reference to the principles, the structure and the history of our Political Institutions. That in the opinion of the Association, the introduction of this study into all our schools could be greatly stimulated if colleges should require a fair knowledge of it as a condition of admission, and they respectfully suggest the subject to college authorities for their consideration."

Notwithstanding these resolutions, the study made but slow progress in the schools, though the need of it was urgently felt because of the ever increasing immigration of foreigners to American shores. As most of the colleges gave little or no instruction in political science, they took no steps toward making it an entrance requirement. After 1870 the subject began to find its way gradually into the elementary schools. In 1876 a report which a committee of the National Education Association made on "A Course of Study from the Primary Schools to the University" made no recommendation for the study of civics in the elementary school, and merely recommended a study of the Constitution in the high schools. In 1879 Justice Strong in an address before the Department of Superintendence of the National Education Association urged that after the three R's, which prepared pupils to make their livelihood, the study of the government under which they were living was of next importance. In some schools the formal study of the Constitution of the United States was made before 1880, but in general this study was largely a memorizing of the constitutional clauses, and the texts used were scarcely more than analyses. Little was done to teach pupils government in its actual working or to teach the duties of citizenship.

Between 1880 and 1890 the study of political science made considerable progress in the colleges, and this movement had much influence on the study of civics in the schools. In many of the high schools, particularly in the West, a brief textbook was introduced in the first year of the high school. Though such texts were brief, they were superior to the brief analyses which had been in use. Papers and addresses on the urgency of teaching civics became more numerous. In 1890 the Committee of Ten was appointed by the National Education Association to report on secondary education. In 1892 President Eliot of Harvard was made chairman, and nine subcommittees were appointed to deal with various secondary school subjects. The eighth of these, known as the Committee on History, Civil Government, and Political Economy, had for its chairman Charles Kendall Adams, President of the University of Wisconsin. The committee carried on some investigations, and discovered that only about one sixth of the elementary schools and one third of the high schools were giving any instruction in civil government. In some of those high schools where the subject was studied it appeared early in the course, and in others it came late. The committee met at Madison, Wis., in December, 1892, and became known as the Madison Conference. It recommended the study of civil government in the eighth grade of the grammar school and in the last year of the high school. The method of instruction in the grammar school was to be by oral lessons with the use of collateral textbooks and in connection with United States history and local geography. In the high school the committee recommended that the textbook should be the basis of instruction, and that it should be accompanied by the study of collateral reading, reports on assigned topics, observations of the workings of the local machinery of government, and comparisons between American and foreign systems of government. The amount of time to be spent was to be one half of that allotted to history in the years mentioned, and the subject was to be studied in close connection with history and as an adjunct to that subject. Nothing was said about its being made a college entrance requirement, as was suggested by the report of 1864.

In 1895 appeared the *Report of the Committee of Fifteen* of the National Education Association on the subject of Elementary Education. This committee recommended in connection with the subject of United States history that there should be given a study of the outlines of the Constitution for 10 to 15 weeks in the last year of the elementary school. In 1897 the Committee on Rural Schools of the same Association made a report recommending a course in United States history and civil government for normal school teachers who were to teach in the rural schools, and made some suggestions about teaching of morals and civics in such schools. In 1899 the Committee of Seven of the American Historical Association — a committee appointed at the instance of a Committee on College Entrance Requirements of the National Education Association — made an elaborate report on history in the schools. They recommended that the fourth year of the high school course be devoted to American history and civics, and that the two subjects be taught in separate courses where it was possible to get the time. Where this was not possible, the committee advised teaching them together.

The high schools generally pursued the latter method in order to save time, with the result that the civics work was mainly in the nature of constitutional history. Very little attention was given to the other elements of civics: the duties of citizenship and government in its actual workings. Because of the failure of the colleges to require a knowledge of civics for entrance, very many schools neglected the subject almost wholly. In 1904 the New England History Teachers' Association published a syllabus upon the lines laid down by the Committee of Seven, and made the same recommendations in regard to civics. This tendency to treat civics as the "poor relation" of United States history and to make its treatment only one of constitutional development met with strong opposition in the Association of History Teachers of the Middle states and Maryland, in the North Central History Teachers' Association, in the New England History Teachers' Association, and in the associations of teachers of various states. Vigorous protests were made against considering the history of an institution the same as the study of an institution in its actual working to-day.

The results of the agitation of the opponents of a combination course resulted in the appointment of a Committee on Civics of the New England History Teachers' Association, and of another by the American Political Science Association. The preliminary sheets of a syllabus were published by the first association in 1908, and the second association published a report in the same year calling for a separate course in civics in the last year of the high school and recommending the making of the subject a college entrance requirement. Throughout the report there is a strong insistence on that view of civics which makes it a study of government in its actual working — national, state, and municipal. The National Municipal League has been actively engaged in promoting the study of municipal civics in the schools, and in its proceedings of 1905 it presented a syllabus for such instruction in both elementary and secondary schools. So far the recommendations have had little effect. The schools of Cleveland, Ohio, have had an admirable syllabus, drawn up for use in this subject, and the High

School of Commerce in New York City has established a course in Municipal Activities.

Notwithstanding the great activity of civic bodies and teachers' associations in all parts of the country, civics as a subject in the schools is still in a very unsatisfactory condition. In spite of the emphatic statements of various committees, it is still taught in the form of constitutional history, and the pupil gets little notion of the way in which the government is actually being carried on at the present time. In the elementary schools of Boston and vicinity no attention is paid to it until the last year, though vague statements are made at times that "civil government shall be taught throughout the course in history." In the last year provision is usually made for the study of the Constitution. In New York City in the elementary schools the syllabus calls for lessons in civics beginning with the fourth grade, and these run through the fifth, sixth, seventh, and eighth grades. In the absence of a detailed syllabus the work is not always as well carried out in some schools as it is in others. The city of Cleveland has prepared the best syllabus for civics in the elementary schools. It begins in a very simple way in the third grade, and is carried through the balance of the eight grades. In the Latin schools of Boston and vicinity the subject is virtually nonexistent. In the high schools it is optional in the third year, and sometimes required, as in Cambridge. When optional it is seldom taken. In New York City and vicinity the course in civics is a part of the course in American history, and is required for graduation.

Between the two extremes represented by these localities there are varying conditions, but in the large majority of the schools where the subject is taught at all it is given as an adjunct of history. As far as statistics can be gathered, it may be stated that approximately one fourth of our secondary schools give no training in civics at all, about one half combine it with American history, and about one fourth give a separate course in it.

At the present time a Committee of Five of the American Historical Association is working on a revision of some of the recommendations of the Committee of Seven, and has made a preliminary report in which a separate course and a separate examination in civics in the fourth year of the high school course is recommended as required. In New York State various committees and civic bodies are at work on the subject, and the same is true in many other states. From such activity it is probable that much more substantial courses in civics will be offered in elementary schools and high schools within the next decade than have ever been offered before.

Methods of Teaching Civics. — The earliest advocates of the teaching of civics in the schools had in mind a method of instruction which should give to pupils a knowledge of the framework of government as it was outlined in the Constitution of the United States. This was the idea of Daniel Read and of the National Teachers' Association. From the resolutions passed by that body in 1869 it is evident that it thought that instruction in civics consisted in teaching "the principles, the structure, and the history of our Political Institutions." Moreover, the study was to be taken up in connection with United States history, and for this purpose the Constitution of the United States was appended to the grammar and high school histories published in the seventies and early eighties. In the bodies of the texts almost nothing was given concerning constitutional government or of the working of the local, state, or national institutions. About two thirds of each text was taken up with the colonial periods, and throughout the emphasis was laid on picturesque narration.

For civic instruction the method consisted in giving the pupils the Constitution to read or to commit to memory. No illuminating material on the actual working of our institutions, national, state, and local, such as could have been found in De Tocqueville, was presented, — a fact no doubt due to the absolute inability of the teachers. This mere "cramming" on the Constitution was felt to be unsatisfactory, and though the study of government was still largely conducted by such a method and felt to be indissolubly connected with the study of United States history, small texts were published in the seventies containing the clauses of the Constitution with comments on them. Such texts were not generally put in the hands of the pupils, but were of aid to the teacher. This method of study of the dry bones of our institutions continued until the middle eighties, when Jesse Macy of the University of Iowa published his small text entitled *Our Government.* This was an attempt by a competent writer to change the prevailing method of instruction in government, and to put interest and life into the mere framework by showing the actual workings. Attention was not confined to the national government, as had been the almost general custom in the past, but considerable time was given to the consideration of local and state governments. In 1888, with the appearance of Bryce's *American Commonwealth,* the revolutionizing of the methods of instruction was made possible. With this monumental work on our government in its actual workings before them, the writers of school texts began gradually to change their methods of treatment. Slowly and almost imperceptibly the texts on civics began to treat of actual government. The committing to memory of the Constitution and the dry commentary on its clauses began to give way to a study of government as actually carried on.

Such a change in method, however, was not by any means general. In most of the schools, high as well as grammar, the average instruction given was usually nothing more than a mere "cramming" on the Constitution. Texts still continued to be written which were nothing except dry commentaries on the clauses of the Constitution, and the texts determined the methods of instruction. It was only in a few of the most progressive schools that good instruction in civics was given.

Meanwhile a very decided change had taken place in the character of the textbooks on United States history. More and more space was given to the constitutional and institutional aspects, and the idea was thus perpetuated that all necessary instruction in civics could be given through the medium of history — a separate text or course for civics not being considered necessary. This method of instruction in the grammar schools and high schools was favored because it "saved time" and because of the conditions surrounding college entrance examinations for which the high schools largely prepared. Most of the colleges gave either very indifferent instruction in government themselves, or none at all, and had taken no steps toward demanding a knowledge of civics for entrance. This prevailing method of instruction gave to the pupils scarcely anything more than a knowledge of constitutional history. This was to a certain extent encouraged by the *Report of the Committee of Seven* of the American Historical Association, 1899, for though recommending a separate text and course in civics it left it open for the schools to believe that the study could well be carried on without such.

Objections to this method of instruction were frequently heard from teachers and superintendents, but it was not until the Committee on Civics of the New England History Teachers' Association, 1909, and the Committee of Five of the American Political Science Association, 1909, made their reports that the issue was squarely made that instruction in civics in schools should be on the actual working of our government and that the methods to be employed should be such as to give something more than constitutional history, and should be through the medium of a separate course. The *Report of the Committee of Five* of the American Historical Association on the revision of the *Report of the Committee of Seven*, 1910, seems to agree with the reports of the two above committees.

Some schools already have in operation distinct courses in civics, though in the larger number of schools throughout the country the older methods of instruction still prevail. In those schools where the separate course is given there are two ways in which it is conducted: (1) in some the course comes after the course in United States history, and (2) in others it is conducted parallel with it. Those who favor the first method maintain that it is necessary for the pupil to know the history before he is able to understand the government in its actual working at the present time; and those who favor the second say that by the parallel method much time is saved by avoiding unnecessary repetition and that a better opportunity is offered for taking up current topics because of the longer period during which the course is studied.

In the best high schools of to-day a course in civics is given which has devoted to it 5 hours a week for 20 weeks or 3 hours a week for 40 weeks. A substantial text is placed in the hands of the students, and also a fair number of special works on the federal, state, and local government. Not onlv is the government of the United States studied, but its institutions are compared with those European governments — the most effective results being derived from comparison. Each student is called upon to present reports both oral and written on topics connected with this comparative study.

In connection with the course a close study of the newspapers and magazines is made for current political happenings, and the students are called upon to give three-minute extemporaneous talks on political events both at home and abroad. The material gathered is put on bulletin boards, pasted in scrapbooks, and used in civic and debating clubs. Government reports, journals, legal forms, and material of an allied nature are consulted in the libraries. Visits are made to the meetings of legislative bodies, courts, and committees. Though the course outlined above is far from being in general use, it is becoming more and more common.

The methods of civics work in the grammar schools throughout the country are very varied. The course in civics is usually carried on in connection with history and geography, and is indifferently handled in most places. The trouble seems to lie in the poor equipment of the average teacher for the work and in the general lack of interest on the part of teachers in the present problems of government. Among grammar schools, as is the case with high schools, there are some marked exceptions and there most excellent methods are in vogue. The study of civics begins in the third or fourth grade in connection with the geography and history of the locality in which the pupil is living. The study usually begins with the roads or streets, the making, the paving, and care of them. Then the water supply is taken up, and gradually the pupil is introduced to more difficult problems, such as, "why are laws made?" and so on, until the whole range of government is covered — local, state, and national. The work is continued throughout all the grades including the eighth or ninth. In some schools the study becomes a distinct course in the eighth or ninth grade, and the opportunity is afforded to give the pupils a thorough knowledge in an elementary way of the actual workings of the government. In the hands of some teachers the course is handled in a fashion similar to that pursued in the best high schools.

The activities of the National Municipal League have been responsible for the introduction in some city schools of special courses in municipal government. Sometimes this course is placed in the last grade of the grammar school or the first year of the high school. The method of teaching is largely inductive. The pupil is called upon to look about him for answers to certain questions given by the teacher and to come to the class prepared to report. The pupil in a way is thus the maker of his own textbook. This simple course of instruction is supplemented in the last year of the high school with older pupils by studying the causes for the failures and successes of municipal government at home and abroad.

In the most modern methods of teaching civics, the idea that the subject should be used to teach patriotism and to drag out moral lessons has been abandoned. The aim has been reduced to the purely practical one of developing good citizens, intelligent as to their duties, knowing wherein the government is good or bad, and able by virtue of their intelligence concerning better conditions prevailing elsewhere to try to improve their own institutions. J. S.

See Citizenship and Education; Current Events, Teaching of in the Schools; History; Political Science.

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The published proceedings of the various associations mentioned in this article contain, in addition to the reports referred to, numerous articles on civics and its place in the curriculum.

The *Atlantic Educational Journal* has published during 1908–1909 a bibliography of history for teachers and is going to add to it material for civics.

CIVIL ENGINEERING. — See Technical Education.

CIVIL GOVERNMENT. — See Civics.

CIVIL SERVICE, EDUCATION FOR. — See Public Service, Education for.

CIVIL SERVICE EXAMINATIONS, AND APPOINTMENT OF TEACHERS. — See Teachers, Appointment of.

CLAFLIN UNIVERSITY, ORANGEBURG, S.C. — An institution for the education of negroes, founded in 1869 and under the auspices of the South Carolina Conference of the Methodist Episcopal Church. Elementary, college preparatory, college, normal, and industrial departments are maintained. The college courses are based on about 3 years of high school work, and lead to degrees, The graduates of the normal department are permitted to teach in the public schools without examination. In the industrial department courses in architecture, woodwork, printing, iron work, and many other trades are given. There is a faculty of 8 professors, 1 assistant professor, 24 instructors and assistants.

CLAP, THOMAS (1703–1767). — Divine and educator, graduated from Harvard College in 1722, and for 17 years engaged in the ministry. He was called to the presidency of Yale College in 1739, but his congregation being unwilling to part with him, the matter was referred to an ecclesiastical council who advocated his release. The legislature of Connecticut voted to pay the congregation "an indemnity of £53 for the loss of their minister." He was president of Yale for 27 years. Author of *Introduction to the Study of Philosophy* (1743), *Religious Constitution of Colleges* (1754), *History of Yale College* (1766), and of several essays on science and religion. W. S. M.

CLAREMONT COLLEGE, HICKORY, N.C. — Founded in 1880 for the higher education of young women. It is under the auspices of the Reformed Church of the United States. Preparatory, collegiate, and fine arts departments are maintained. The college courses which lead to diplomas are based on approximately 4 points of high school work. There is a faculty of 9 instructors.

CLARK UNIVERSITY, ATLANTA, GA. — A coeducational institution for the education of negroes, founded in 1870 by the Freedman's Aid Society of the Methodist Episcopal Church. Elementary, academic, collegiate, and normal departments are maintained. Classical and scientific courses based on about twelve points of high school work are given in the college, and lead to degrees. The faculty of the college consists of 6 professors, 1 assistant professor, and 3 instructors.

CLARK UNIVERSITY, WORCESTER, MASS. — A nonsectarian institution, originally limited to graduate instruction, opened in 1889, and founded in 1887 by the gift of Jonas Gilmore Clark, an American philanthropist, who began life as a carriage maker and gained a fortune through real estate and business investments. Besides $2,000,000 with which he endowed the university at its inception, he bequeathed $200,000 outright and $1,000,000 and the residue of his estate subject to certain conditions. From the beginning, the policy of the university has been to limit its activities with a view to thoroughness and to scholarly efficiency; there are only the 9 graduate departments of mathematics, physics, chemistry, biology, anthropology, psychology, pedagogy, economics and sociology, and history, and an undergraduate college established in 1902. In accordance with the will of the founder, the undergraduate course has been limited to three years, in the belief that it is possible for the average student to effect important economies in his work. Fraternities have recently been introduced in the college as follows: Kappa Phi, Phi Mu Upsilon, Alpha Sigma Alpha, Locridion, Phi Delta Sigma, and the Griphon. Intra-collegiate contests replace intercollegiate athletics; partly because the institution is of such recent foundation, the proportion of teachers to students (one to four) is higher than that of any other American university except Johns Hopkins. The absence of social distinctions, and the close contact of student and instructor has caused the college to be characterized as "a hard-working academic democracy." In the place of entrance examinations, the character and school record of each candidate are examined by a faculty committee. In the graduate departments, teachers and students are regarded as fellow laborers, the students giving occasional lectures. A summer school was held during the nine years ending in 1903. In 1899 and 1909 the decennial celebrations were marked by commemorative volumes of reports and addresses. The university is connected with the *American Journal of Psychology*, the *Pedagogical Seminary*, and the *American Journal of Religious Psychology and Education*, all published in Worcester. The university was one of those originally accepted by the Carnegie Foundation for the Advancement of Teaching (*q.v.*). The first Board of Trustees of nine members was selected by the founder; the board is now self-perpetuating.

Grounds, buildings, and equipment were valued (1906) at $595,500; the total annual receipts were (Treasurer's Report, Sept. 1, 1908) $297,052.70; balance over expenditures was $38,093.73. The productive endowment amounts to approximately $4,000,000. The average salary of a professor is $3000. There are 37 members on the instructing staff, of whom 8 are full professors. The students number 128, divided as follows: graduate students, 91; undergraduates, 25; Saturday courses, 25. The nature of the university makes numbers a secondary consideration. G. Stanley Hall, Ph.D., LL.D., is president. Carroll D. Wright, first president of Clark College, died Feb. 20, 1909, and has been succeeded by Edmund Clark Sanford, Ph.D.

C. G.

CLARKE, JOHN. — Headmaster of the Lincoln Grammar School, *c.* 1624; called in Lucy Hutchinson's *Life of Colonel Hutchinson* a "superstitious pedant." Clarke published books of merit for use in grammar schools. His *Dux Grammaticus* (1633) gives a comprehensive dialogue of duties at home and abroad of the schoolboy. It is an interesting manual of the teaching of manners and morals. Clarke wrote *Formulae Oratoriae* (4th ed., 1632) which shows exactly, point by point, the building up of an oration, as a school composition for speeches on important occasions, and he includes two *Orations* as delivered in the Lincoln Grammar School in 1624 and 1625, practically the most complete specimens of school orations, of the old type, extant. In 1639 Clarke published *Paroemiologia Anglo-Latina* (*Proverbs English and Latin*). This deserves notice, since Clarke states that he has "gleaned and gathered these Proverbs out of all writers I could read or meet withal and have used herein the help of sundry scholars, and worthy friends, over and besides my own observation of many golden proverbs dropping now and then out of vulgar mouths, *ima de plebe*." To these he supplies appropriate Latin. In his *Phraseologia Puerilis* (1638) Clarke writes the noteworthy sentence, in an age of Latin, "To speak our own Mother-English Tongue purely, properly, elegantly is (for aught I know) as commendable as to speak French, Spanish, Latin, or any other exotic and foreign language." His religious books show that he must have been strongly puritanic, and probably founded his school teaching often on rhetoric drawn from the Scriptures.

F. W.

CLARKE, JOHN (1687–1734). — Master of the Grammar School, Hull, and afterwards at the Crypt Grammar School, Gloucester. He graduated from St. John's College, Cambridge, M.A., 1700. He wrote the following school books: 1718, *A Select Century of Corderius' Colloquies;* 1730, *Select Colloquies of Erasmus;* 1733, *Latin Grammar*, with a dissertation on Language; 1734, *Translation of Sallust* with dissertation upon the usefulness of translations of classical authors; 1740, *Introduction to the Making of Latin.* On education Clarke wrote well-known books: 1720, *An Essay upon the Education of Youth in Grammar Schools, in which the vulgar method of teaching is examined and a new one produced;* 1731, *An Essay on Study, wherein directions are given for the due conduct thereof and the collection of a library.*

F. W.

CLARKE, JOHN (1706–1761). — A schoolmaster who was educated at Wakefield and graduated from Trinity College, Cambridge, 1726. Schoolmaster of grammar school at Skipton and Beverley. Known as "Little Aristophanes." Dr. Zouch wrote a biography of Clarke, entitled *The Good Schoolmaster,* York, 1798.

CLARKSBURG COLLEGE, CLARKSBURG, MO. — Founded in 1876, under the auspices of the Baptists of Central Missouri. It is a coeducational institution maintaining academic, collegiate, and musical courses. Graduates from approved high schools are admitted without examination. The college courses are based on about twelve points of high school work, and lead to degrees. There is a faculty of six professors.

CLARKSON MEMORIAL SCHOOL OF TECHNOLOGY, POTSDAM, N.Y.—Founded in 1895 and chartered Mar. 19, 1896, by the Regents of the University of the State of New York (*q.v.*). The courses, admission to which is by examination or certificate from approved high schools, comprise instruction in language and literature, the applied and economic sciences, engineering, and technology. The first two years are devoted to training in the fundamentals of engineering; the last two, to the branches of chemical, civil, electrical, and mechanical engineering, as the student elects. Courses are also offered leading to certificates in chemical, electrical, and mechanical science, drafting, surveying, and technology, upon completion of two years' college work, planned with a view to positions in the civil service and in various industries. Fraternities have been established as follows: Omicron Pi Omicron and Sigma Delta, both local societies. A liberal estimate of students' expenses is given as $330; a minimum estimate, as $298.

The Board of Trustees is a self-perpetuating body of seven members. The institution is one of those originally accepted by the Carnegie Foundation for the Advancement of Teaching (*q.v.*), and participates in its system of retiring allowances to professors. The grounds, buildings, and equipment are valued at about $162,000; the total annual income was (1908–1909) $23,749. The average salary of a professor is $1360. There are (1909) ten members on the instructing staff, six of whom are full professors; the students number 94. William Sleeper Aldrich, M.E., is director.

CLASS INSTRUCTION. — See GROUP INSTRUCTION; INDIVIDUAL INSTRUCTION; GRADING AND PROMOTION; UNGRADED CLASS; DEPARTMENTAL TEACHING; TEACHING, METHODS OF.

CLASSROOMS. — See ARCHITECTURE, SCHOOL.

CLASS, SCHOOL. — See GRADING.

CLASS TEACHER. — A teacher having responsible charge of a classroom. In the ordinary organization of the elementary school, the teacher who instructs and manages the pupils of a single classroom. Under the "departmental" system of instruction (where the instructor teaches many classes or grades in one or two subjects only, as in most high schools and in some higher elementary grades) the class teacher is the one assigned to the responsible management of a particular class, over and above his teaching duties. He is usually responsible for the physical conditions of the classroom, for attendance and other routine matters, for the general morale of the class, and for the supervision of the personal welfare of the pupils under his immediate charge.

See TEACHER; DEPARTMENTAL TEACHING.

CLASSES. — See GRADING.

CLASSICAL LANGUAGES. — See GREEK; LATIN.

CLASSIFICATION. — See GRADING; ORGANIZATION.

CLASSIFICATION OF EDUCATIONAL PUBLICATIONS. — See LIBRARY CLASSIFICATION OF EDUCATIONAL PUBLICATIONS.

CLASSIFICATION OF MENTAL PROCESSES. — For purposes of scientific study, conscious processes must be distinguished as belonging to different classes. These classes differ from each other in the character of the conditions from which the processes arise, and in the elements of which the processes are composed. The classification which long had vogue in psychological writing emphasized almost exclusively the elements of which states of consciousness were composed. This classification distinguished accordingly between forms of knowledge, forms of feeling, and forms of volition, because these three types of mental activity can easily be distinguished through introspection. In more recent times classifications have laid stress on the conditions of mental processes. Thus sensory and ideational processes differ in that the former are derived from direct stimulations of the senses, while the latter are derived from memory processes which are seated, so far as their physiological conditions are concerned, in the central nervous organs. Still other considerations may enter into the classification. The degree of complexity has often been recognized; thus perception is a complex of sensations, emotion is a complex of feelings.

All these types of classification are valuable for purposes of scientific study, so long as the concrete facts are recognized as more important than any scheme of classification.

C. H. J.

CLAVIUS, CHRISTOPHER (CHRISTOPHER KLAU, sometimes thought to have had the German name **SCHLÜSSEL).** — Born at Bamberg, Germany, in 1537, and died at Rome in 1612. He was a Jesuit priest, and taught in a Jesuit college at Rome, called there, it is said, to undertake the reform in the calendar (*q.v.*) instigated by Pope Gregory XIII. He was an excellent teacher of mathematics, and his textbooks were models of good arrangement. Indeed, his algebra was the first really usable school book on the subject that appeared. His arithmetic appeared in 1585, and went through several editions. His algebra appeared in 1608. His collected works were published in five volumes at Basel in 1612, the year of his death. The teaching of mathematics owes more to Clavius than is generally conceded.

CLAY MODELING. — See Pottery Work in the Schools.

CLEANLINESS OF THE SCHOOLROOM. — In the history of education the word "dust" has become almost a symbol for the school, and everywhere in scholastic literature the dust and odor of the schoolroom are liable to greet us. In spite of modern hygiene, the force of inertia and of tradition has been so strong that even to-day schoolhouses are proverbially stuffy; and observation and investigation alike show the atrociously dirty character of many of them. But lack of cleanliness in schools is to-day unpardonable; for science has given us a gauge of cleanliness, and hygiene has shown the danger of the less obvious forms of dirt, while modern invention has made scientific cleanliness possible. The number of bacteria present in a schoolroom is the scientific standard of cleanliness. Dust furnishes a favorable medium for bacteria, and the number in the air of a schoolroom depends largely on the amount of dust.

Scientific investigation has shown that it is possible to reduce the number of bacteria to a minimum, and on the other hand investigation has shown that by the scientific standard the actual condition of schoolrooms is usually bad. Dr. Cacace in Capua found the number of bacteria in the school dust was really colossal, varying in the classrooms from 5 to 25 millions per gram of dust, while in the gymnasium the number was between 17 and 40 millions, and in the kindergarten between 70 and 103 millions. The greatest number was found in June; and at the end of the hours of instruction there were more bacteria than at the beginning. The number in the dust of the kindergarten was explained by the location of the room on the ground floor, with windows opening on a broad and dusty street. The significance of the figures in regard to the number of microorganisms is illustrated by the results of Hesse's investigation. The air on high mountains and on the sea he found almost free from bacteria, but in one cubic meter of the air of a Berlin schoolhouse he found 15,000 microörganisms. According to his estimate each pupil during 5 hours of instruction inhaled 50,000 germs, and the number would be still higher if one of the hours were spent in gymnastic exercises.

Meyrich, a teacher in a Leipzig school, made a similar investigation by a different method, developing plate cultures after 5 minutes' exposure in schoolrooms during the period of instruction. In one schoolroom tested the number of colonies of bacteria that developed after 72 hours was 158, as compared with only 5 germs which developed under similar conditions from a culture in his own living room.

From such investigations it appears that the number of bacteria in the air of a room is a scientific gauge of its cleanliness, and that the number depends: (1) on the conditions outside the schoolroom, among them the following: the season of the year, the weather, the general surroundings; (2) still more on the conditions inside of the building: conditions that favor the stirring up of the dust, the degree of ventilation, the general cleanliness of the room, the cleanliness of the children, the methods of sweeping, the use of the feather duster, and the like.

Some of the microörganisms are pathogenic, most of them are harmless. But the importance of having the schoolroom clean is shown in the first place by the fact that the dust is liable to do mechanical injury to the tissues of the nose and lungs; as Burgerstein thinks, there are likely to be minute splinters with sharp points and corners which make incisions favorable for inoculation with the tubercle bacillus. Further, the greater the number of the bacteria, the greater the chances that some of them will be of a dangerous character. Not to mention other diseases, the battle against tuberculosis demands cleanliness; and, as in the dust-producing industries, to quote Dr. Albrecht: "The breathing of dust deserves perhaps the greatest consideration of all the injurious conditions of industry," so in the schoolroom the necessary means should be adopted to protect pupils by the very best methods from inhaling any kind of dust.

The sources of pollution of the air of schoolrooms are many, among the chief being dirty children, dirty clothing, chalk dust, coal dust, the miscellaneous dust of out of doors, the air exhaled by the pupils — especially by the 80 per cent of them who are likely to have decaying teeth. And thus the whole problem of cleanliness becomes a complex one. In order to have clean children it is often necessary to have school baths; in order to keep children with purulent discharges from the ear or the like out of school, medical inspection is necessary; in order to reduce the number of decaying teeth, school dentists are needed; but greatly improved conditions can be insured by the adoption of modern methods of ventilation and of cleaning schoolrooms.

The feasibility of such methods has been recently demonstrated; by vacuum cleaning it is possible to have a clean schoolroom every morning. In some buildings used for educational purposes in New York City, in Hartford, Conn., and a number of other cities, vacuum cleaning plants have been installed. In every schoolhouse equipped with a mechanical system of ventilation or supplied with electricity, vacuum methods can be employed. The cost for the plant is considerable, but the cost for power is practically nothing, and the movable electric cleaners are inexpensive. More time and labor and intelligence on the part of janitors, however, are required with such methods. For every schoolhouse to be erected this method of cleaning should be considered. When vacuum methods cannot be employed, the use of the kerosene oil brush, or of sawdust mixed with oil, or patent preparations of oil and the like, can be used with good effect. Investigations under the direction of the health officer in Milwaukee some years ago indicated that by the abolition of dry sweeping and the continuous use of the kerosene oil brush the number of bacteria was reduced practically to zero. Washing a room or spraying it does not necessarily remove the bacteria; frequent flushing with fresh air by recess ventilation decreases the number; the various oil preparations make the dust stick to the floor; but the continuous use of vacuum methods or the like removes the dust and bids fair to reduce the number near to a minimum in the best buildings.

The demands of cleanliness extend also to all the apparatus and methods of the schoolroom. All textbooks should be sterilized periodically by the use of heated moist air. Individual drinking cups should be washed in boiling water every night or destroyed and replaced by new ones. An alternative is the use of drinking fountains. Clay should be sterilized for use by superheated steam, and in general scientific cleanliness as well as common decency demand clean floors, clean air, clean clothing, clean hands, clean textbooks and school apparatus. Many of the current practices in the school are emphatically condemned by modern hygiene. Four things are an abomination in any school; namely, dry sweeping, a feather duster, a common drinking cup, and a common towel.

The English Children's Act of 1908 gave the Education Authority power to cleanse school children in default of the parents. But it is reported that no satisfactory method for quickly sterilizing and drying clothes has been devised. Formalin fails completely with pediculi. Steam at 100° C. has been experimented with, and in 20 minutes complete sterilization and destruction of vermin was possible. A method of using moist hot air, as in sterilizing books, would perhaps be feasible. School baths have been introduced into many schools in Europe and this country with good results.

The surroundings of the school building also should be clean. There should be no garbage heaps, dumps, ill-smelling industries, or the like permitted in the vicinity. The presence of flies in a schoolroom is an indication of uncleanliness of the surroundings. Investigation is likely to show in the neighborhood a stable where horses are kept or a dump or a garbage heap or the like. The house fly never should be permitted in a schoolroom, not only because it carries infectious disease, but also because it is a sure indication of uncleanliness in the surroundings.

While the solution of the problem of cleanliness in the schoolroom is difficult, it is of the first importance; and the following are among the essentials involved in it: —

(1) The location of the school building should favor cleanliness. The building itself should be large and spacious, and of simple construction. The so-called hospital construction should be used as much as possible, sharp corners being filled or avoided, no wainscoting or ornamental finish of carved work being used, while the walls and ceilings should be of hard smooth finish, and the floors of the best hardwood. (2) The system of ventilation should be planned with regard to cleanliness; the fresh air should be taken from as favorable a locality as possible, and it should be screened of dust before being introduced into the building. (3) The ordinary means of cleanliness should be utilized. The approaches to the schoolhouse should be of asphalt or similar material, and wire matting should be used at the doors. (4) Measures should be adopted for insuring clean children. The only efficient means seems to be the introduction of school baths. (5) Care should be taken to insure clean clothing of all who enter the school. For this it is necessary that there should be separate rooms for wraps, and special devices may be adopted, as brushes for the shoes and clothes. Most important of all, the coöperation of parents should be secured. Hence the need of school nurses and social workers. (6) For cleanliness in the school atmosphere it is necessary that the teeth of the children should be attended to. From a hygienic point of view the introduction of school dentists seems to be necessary. (7) Habits of personal cleanliness should be instilled into the pupils.

The essential methods for removing the impurities that in spite of all care will be found in schoolrooms are the following: —

(1) The best method for reducing the dust seems to be the use of vacuum cleaners. Dry sweeping, use of a feather duster, common drinking cups, and common towels, should be forbidden. (2) The use of blackboards should be reduced to a minimum; and where blackboards are used, the best quality and the use of dustless crayon are advisable; in case ordinary chalk is used, then removable troughs and the cleaning of the erasers are necessary. (3) There should be no promiscuous use of pencils, penholders, etc. Textbooks should not be exchanged or transferred from one class to another without disinfection. Slates, slate pencils, and sponges should not be used at all.

(4) There should be periodic disinfection of the schoolroom, apparatus, books, and other materials. (5) Individual cups washed daily in boiling water, or else drinking fountains of the improved sort, should be provided. (6) All school property left in the school building by a child sick with a contagious disease should be disinfected or destroyed. W. H. B.

See AIR OF THE SCHOOLROOM; HEATING AND VENTILATION; CONTAGIOUS DISEASES; DISINFECTION; TEETH, HYGIENE OF; BATHS; HYGIENE OF THE SCHOOL.

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CLEARNESS. — When all the elements of an experience are vividly recognized and their relations are also vividly recognized, the experience is said to have the characteristic of clearness.

See ATTENTION; DISTINCTNESS; VIVIDNESS.

CLEARNESS. — The first of the four steps of the recitation or inductive development lesson as originally suggested by Herbart. By the step of clearness, Herbart means to indicate the stage where the individual details are grasped clearly as particulars in the whole which is presented. In present terminology, this step is expressed by the terms " analysis " or " preparation " and " presentation."

See APPERCEPTION; RECITATION, METHOD OF.

CLEAVELAND, NEHEMIAH (1796–1877). — Educator; graduated from Bowdoin College in 1813, and for forty years engaged in teaching in secondary and collegiate institutions — Dummer and Phillips-Exeter academies and Bowdoin College. He was active in the American Lyceum Association (*q.v.*) and was one of the founders of the American Institute of Instruction (*q.v.*). Author of *History of Bowdoin College,* and of numerous papers on education in proceedings of associations and in journals. W. S. M.

CLEAVELAND, PARKER (1780–1858). — Educator; graduated from Harvard in 1799, and for two years served as a tutor in that institution. For twenty years (1805–1825) he was professor of science in Bowdoin College, and he published the first American textbooks on geology and mineralogy. W. S. M.

CLEF. — See MUSICAL NOTATION.

CLELAND, JAMES. — An English writer who in 1607 published Προπαιδεία, or *The Institution of a Young Nobleman,* at Oxford; but Mr. Madan says, " The author was not an Oxford man, not apparently connected with the place in any way." Cleland does not recommend a nobleman to go to the University, but instead to go to Prince Henry's Court or Academy at Nonsuch. Nevertheless, Cleland's book is of great interest educationally. The subjects treated are: 1. The duty of parents toward their children. 2. The duty of Tutors. 3. The young Nobleman's duty towards God. 4. His duty towards his parents and tutor. 5. His duty in civil conversation. 6. The Nobleman's "way," in traveling. Gentleness is to be shown to children, " for he that would have a rose or a violet to smell sweetly, must not crush them in his hand or burn them in the fire." The tutor is to hide his own disposition, whilst he discovers that of his pupil. Let the boy " lay his eyes about him," develop his judgment, and be modest. Let him be familiar with and inquire from the " meanest tradesman." He may have something from the least "foot-boy that goeth by the way." Ever keep him occupied. Let all the world be his book. Great care is to be taken in learning the catechism and the Bible, in the fashioning of manners. " Above our pupil's school chamber I would have Joy, Lady Flora, and the three Graces painted, that he may see pleasure is joined with profit." Cleland has chapters on the teaching of reading, writing, and grammar; the Humanities; Logic and Philosophy; the Mathematics. Memory is unduly esteemed; judgment and imagination ought to be rather sought. The mother-tongue is praised highly. See, he says, that the nurse and servants speak the vernacular purely. Pay attention to clear and distinct reading, with a sweet accent. Latin should be taught by the simplest grammar-teaching and the colloquies of Vives (*q.v.*) and Corderius (*q.v.*). Sound English speaking precedes Latin speaking. Cleland is an advocate of early study of the French language, the accent of which is best learned in childhood; Greek is best begun with the Greek Testament. The reading of history is, at length, the nobleman's chiefest study. Names and dates are only the "anatomy" of the study; the training of the judgment is the chief concern. Simple logic is necessary for higher studies. Mathematics, including geometry, architecture, descriptive geography, with maps and globes should be studied. Law is a necessary equipment, for even the interpretation of an Act of Parliament or the statutes of the realm as well as for common law. The nobleman will be a magistrate, or at any rate will constantly be asked for advice in practical affairs requiring legal knowledge. Cleland gives careful advice for general reading of books. On all points of behavior at home, abroad, and at court, the nobleman must be correct and dignified. Physical exercises and traveling complete his equipment. Cleland thus is important, first, in his emphasis on the complete command of the vernacular; secondly, for his idea of an all-round education, which brings the classics into a modified systematic perspective. F. W.

CLEMENT OF ALEXANDRIA. (150–215).—The details of the life of Titus Flavius Clemens, known as Clement of Alexandria to distinguish him from his namesake of Rome, are obscure. Hardly a date in his life is more than a conjecture. Yet the personality of the man is very clearly defined by his writings which are among the most important of the Ante-Nicene period of the Church. He appears to have been born about the middle of the second century, but in what country is not known. Before he settled in Alexandria, shortly before 190, he had traveled extensively in Greece, Italy, Palestine, and the Orient, and he had studied under teachers from widely separated provinces before he met his last teacher, Pantænus, the "Sicilian bee," the reputed founder of the Catechetical School of Alexandria (*q.v.*). Clement became his colleague in this school about 190, and here he worked for several years busily engaged in teaching. He succeeded to the headship of the institution soon after 200, but on account of the persecution under Septimius Severus he fled from Alexandria in 202 or 203, never to return. In 211 he appears for a moment in Jersusalem, in which his pupil Alexander was settled as Bishop, for in that year he is the bearer of a letter from the Church at Jersualem to the Church at Antioch. He then disappears from history, and was certainly dead before 216. Clement was not the first educated Greek to become a Christian. Justin Martyr was in this his predecessor, and gave the line of thought which Clement developed, whereby Greek philosophy and Christian teaching were brought permanently into conjunction. The importance of this for Christianity and Christian education can hardly be overestimated. So long as philosophical thought and metaphysical categories should be applied to Christian doctrine it would be necessary to study Greek philosophy either in the works of the great masters or in those of their epitomizers. When Christian theology had once become, under the influence of the School of Alexandria, a philosophical science, the interest in philosophy never died out, but flourished with the flourishing of religious thought. This interest continued active in the East at least until the times of John of Damascus, the founder of Greek scholasticism. In the West the philosophical activity of scholasticism is ultimately traceable to the influence of Clement upon theology. In general the position of Clement regarding philosophy was that in the divine economy Greek philosophy held in the case of the Greeks the same place as did the Mosaic law, including the prophets, in the case of the Jews. A knowledge of both was therefore needed as a preparation for the understanding of Christian teaching. The application of this principle Clement was able to sketch out at considerable length in his great work, which without a title as a whole is made up of three parts, entitled respectively, *Exhortation to the Greeks*, the *Instructor*, or *Pedagogue*, and the *Miscellanies* or *Stromata*. A few fragments, doubtful works and a minor piece, have also been preserved, but they add little, to our knowledge of the teaching of Clement. In common with much Greek thought, Clement regarded knowledge as the basis of virtue, and advance in knowledge as advance in virtuous living. He therefore delighted in regarding the Christian, in opposition to the various Gnostic heretics, as the true Gnostic, and he thereby, perhaps, gave an over-emphasis to the intellectual side of Christianity. This, however, was a natural consequence of the notion of the Logos, which plays so large a part in his speculation. The Logos was the divine Reason, revealed in part to the Greeks and in part to the Jews, but now revealed completely and personally in Christ. This Logos was the divine Pedagogue, and his training was therefore addressed to the reason or understanding. In the *Pedagogue* Clement develops at length his ideal of Christian training of character, going into all sides of the daily life, and pointing out details which sometimes hardly come up to the dignity of the subject, but giving an admirable picture of his ideal of Christian moral education. In this portion of his work, Clement did not hesitate to borrow largely from the Stoic philosopher Musonius. Clement was a man of uncommonly wide reading, but singularly unsystematic and desultory in style and thinking. Yet he seems to have exerted a powerful influence upon his pupils, especially Origen, and though deficient in the art of systematic exposition to have succeeded as a teacher. J. C. A.

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CLEMSON AGRICULTURAL COLLEGE, CLEMSON COLLEGE, S.C.—Opened in 1893, as an institution to give preparatory, agricultural, and engineering courses. Seven four-year courses are offered, leading to the degree of bachelor of science. The entrance requirements for these courses are somewhat higher than those for graduation from a grammar school. The institution also gives courses in cotton grading and textiles. The faculty consists of 38 professors and 6 instructors and assistants.

CLERGY, BENEFIT OF. — See Benefit of Clergy.

CLERGY, EDUCATION OF. — See Ministry, Education of.

CLERK. — Whatever may be the true origin of the term "clerk," whether it is derived from the bishops as the successors of the Apostles, on whom the lot of the ministry fell, as on the election of Matthias (Acts i, 17), or from the early Christians, who had part or lot in the Lord or the Kingdom of Heaven, by the time that we meet it in records of medieval Europe it had come to mean the whole clergy, every one who was in any one of the seven or eight orders, down to the *ostiarius* or doorkeeper, and later, any one who had taken the first tonsure, that is, had shaved a patch in the middle of his head and been recognized as a cleric. But, concurrently with this meaning, because to the world a more certain sign of clericalism than the tonsure, which might be neglected by the man who had a right to it and assumed by him who had not, was learning, that is, a knowledge of Latin. "Clerk" came to mean a learned person, and, in particular, a scholar, whether learner or teacher. In an age of violence, great were the privileges of being a clerk, and they were continually growing. A clerk was in theory free from fear for his person. Any one, clerk or layman, who assaulted a clerk, was *ipso facto* excommunicate, and absolution for the offense was reserved to the Pope himself. A clerk was not amenable to the fierce justice or injustice of the lay courts, which not only hanged, but mutilated, on the smallest provocation. A clerk, convicted of any crime, must be handed over to his ecclesiastical superior, and though he might be imprisoned by that superior and made to do penance in very unpleasant ways, he would not be deprived of life or limb. This privilege became known as benefit of learning, and in the thirteenth and fourteenth centuries we find the ecclesiastical authorities, bishops or chapters, appointing representatives to attend at the assizes of the royal courts and claim the surrender of clerks convict to their mild paternal jurisdiction. In later times the courts themselves seem to have let their convicts go free for the first time on proof of clerkship by reading a verse of the Psalm, which became known as the *Neck-verse*. A clerk could not even be burnt for heresy until he had first been degraded from clerkship.

Great was the attraction of being a clerk, for though theoretically a clerk could not assault others or wear arms, clerks habitually did so, and were in the happy position of being able to say, "If you kill or maim me, hell waits for you; if I kill or maim you, the bishop's prison waits me." It is not surprising, therefore, that all scholars claimed and were allowed the benefit of clergy, and that "clerk" is used indiscriminately for "scholar" and *vice versa* where any question of learning is concerned. Strictly speaking, the scholars were a particular kind of clerk, and from 1180 to 1500 we find the term "scholars-clerks" (*scholares clerici*) used as a term of art for the scholars for whom endowments were given by the founders of university or school exhibitions or colleges (*q.v.*). The most notable instance of it is that to the present day the legal corporate title of Winchester College is "the Warden and Scholars Clerks of Seint Marie College of Wynchestre." Whether it means clerks who are scholars or scholars who are clerks is not clear. It is certain that when they attained the age of 15, the scholars of Winchester were obliged to undergo the first tonsure. At Pontefract, St. Nicholas Hospital had to find forty loaves a week for poor scholars. In Inquisitions in 1267 they appear as *escolers del escole*, in 1437 as *secularibus clericis pauperibus*, in 1464 as *pore secular clerks*, if the two last are not properly read *scholaribus clericis* and *scholar clerks*. Thus in the fifteenth century Latin-English vocabularies, published by T. Wright, we find *Nomina dignitatum clericorum*, the names of the ranks of clerks. After *Ostiarius*, usher, comes *hic scolaris* a scoler, *hic clericus* a clerke, *hic discipulus* a disciple in one, and after 'sophister' and 'bachelor' in the other, *clericus*, a clerke, followed by *scolaris*, a scoler. Schoolboys were often spoken of, not as clerks, but as little clerks, *clericuli*, *clergeons*. So the famous grammar in verse of Alexander of Dol, written about 1240, which ruled the schools for some three centuries, begins: "I prepare a lesson-book for little clerks who are new to learning" (*Scribere clericulis paro doctrinale novellis*); and on the foundation stone of Giggleswick Grammar School, Yorkshire, is inscribed, "For priests also for little clerks this house is made in the year 1512" (*Presbiteris quoque clericulis domus hic fit in anno* 1512). So, in the *Prioress' Tale*, Chaucer's 'litel clergeon, seven years of age' was a scholar in a Song School which taught reading and singing but not grammar. At the universities, the privileges of clerks were extended to every one who served the scholars, whether as servants or tradesmen.

The meaning of "clerk" has fallen from its high estate; though the Clerk of Parliaments is still a high official, and, in legal documents, a priest of the Established Church is still described as a "clerk in holy orders," neither would be pleased if described as a clerk, *tout court*, a person who makes entries in a book and writes letters from dictation. A. F. L.

See Benefit of Clergy; Bishops' Schools; Church Schools.

CLERMONT-FERRAND, UNIVERSITY OF. — Established under the University Act of France in 1896. Faculties in letters and sciences had existed since 1854. These, with the preparatory school of medicine and pharmacy, now make up the university. Two hundred ninety-three students were enrolled in 1908 in the three faculties.

See France, Education in; University.

CLEVELAND, CHARLES (1802-1869). — Educator and textbook writer; graduated from Dartmouth in 1827. He was a teacher for many years in New York City and Philadelphia and professor in Dickinson College. Author of a series of textbooks on English literature. W. S. M.

CLEVELAND, CITY OF. — The largest city in the state of Ohio, and a large commercial and manufacturing center. Incorporated as a city in 1836. In 1900 the city had a population of 381,768; its estimated population in 1909 was 506,938. Of the total population of 1900, 33 per cent were foreign born, and 1.5 per cent of the colored race. Of the foreign born of 1900, 33 per cent were Germans, 15 per cent English, 11 per cent Bohemians, 10 per cent Irish, 8 per cent Huns, 7 per cent Poles, 3 per cent Italians, and 3 per cent Russians. The school census, 6 to 21 years of age, was 128,045 in 1908, and the total school enrollment in 1909 was 69,764 in day schools and 5667 in evening schools. The enrollment in private and parochial schools was 26,569 additional.

History. — The first school in Cleveland was opened in 1800, for the five children of the three families then residing there. This was a private school, as were all the schools up to 1836. In 1816 the town built a school building, which was supplied, rent free, to a teacher who maintained a tuition-school in it, admitting a few pauper children free. In 1821 the citizens built a two-story brick building for a higher school, then called the Cleveland Academy, which was let out on similar terms. In 1836 the city was organized and chartered, and the first free school was opened in the same year. By the terms of the charter, the City Council was to appoint a Board of Managers of Common Schools, for one-year terms, who were to manage the schools established. The Council was directed to provide for schools by the levy of a tax of not over one mill for sites and buildings, and not over one mill for maintenance. The School Board was thus, in the beginning, little more than a subcommittee of the City Council. By 1838 there were six free schools, with 840 pupils; and by 1842 there were fifteen schools, with 1200 pupils. In 1841 the supervision of the schools was placed in the hands of an Acting Manager, who was also a member of the Board and its Secretary; and in 1853 the office of Superintendent of City Schools was created. In 1846 the Central High School for boys was established, the first in the state, and in 1847 a department for girls was added. Both of these schools encountered great opposition at the time. In 1850 an intermediate department was organized, and the schools were graded into four departments, — viz. Primary, Intermediate, Senior, and Central High. In 1856 the study of the classics was introduced into the Central High School, which up to that time had been an English high school. In 1864 the West Side High School was organized, and in 1872 the East Side High School. Since then four other high schools have been added.

In 1859 a Board of Education for the city was created by special legislation, to be elected by popular vote, one from each ward, and one half each year. This took the place of the old Board of Managers appointed by the Council. The latter body still retained control of the finances, but it was required by the law "to support two high schools" and a sufficient number of other schools "to furnish a good common school education to all children" in the city. In 1868 the authority of the Council to control the finances was removed, and the Board of Education was allowed to levy its own taxes. Boards of Visitors for the schools were abandoned at the same time. This form of board organization remained in force until 1892. In 1861 gymnastics were introduced into the work of the schools; in 1864 vocal music; in 1869 German into all grades of the schools; in 1874 a city normal school was provided for; and in 1888 the first truant officer was appointed to enforce the compulsory education law.

In 1892 a new plan of school organization, known as the Cleveland plan (*q.v.*) or Federal plan, was provided for by special law. The old Board of Education was abolished, and a School Council of seven members, elected at large, took their place. This was a legislative body only, and all executive functions were centered in a School Director, also elected by the people, who selected the City Superintendent and all subordinates. In 1904 and in 1908 general state laws with reference to city school systems caused a still further change in organization, resulting in the adoption of the present plan.

Present System. — As at present organized, the city school system of Cleveland is as follows: A Board of Education of seven, elected at large, on a separate school ticket, for four-year terms, now controls the schools. The election of all executive officers, including the School Director, is placed in the hands of this Board. A Clerk attends to all secretarial and clerical duties. A Director, elected for two-year periods, acts as the executive officer of the Board in the conduct of all business. (See article on CITY SCHOOL ADMINISTRATION, and CLEVELAND PLAN.)

The Superintendent is appointed for five years, and acts as the executive officer of the Board in all matters relating to instruction and discipline. He appoints all teachers, subject to confirmation by the Board, for from one- to four-year terms, and has control of the work of the schools. The Superintendent is assisted in his work by two Assistant Superintendents, and special supervisors of English, German, manual training, arithmetic, kindergartens, penmanship, geography and history, language and substitute teachers, physical education, music, and drawing. A Board of Examiners examines and certificates all teachers for the schools. The merit system of promotion is used for the teachers in both the elementary and the high schools, and a system by which both experience and efficiency are recognized in making salary increases is employed. A teachers' pension fund, formed by the setting aside of 1 per cent of the total income for schools by the Board of Education, and of $20 each year by the teachers, exists for the pensioning of teachers.

The school system consists of a normal school, a technical high school; 6 other day high schools, with art and manual training departments; 80 day elementary schools; 42 kindergartens; 7 centers for manual training and cooking; 4 evening high schools; 50 elementary evening schools; 1 school for the deaf; 10 schools for defective children; 6 schools for backward children; 1 epileptic school; and 1 boys' detention home. Manual training, drawing, and applied arts are taught in all grades of the school system. School gardens, summer schools, and medical inspection are provided. In 1908–1909 the system employed 117 supervisory officers, 1952 teachers in day schools, and 134 teachers in evening schools. At the beginning of 1905 the school accommodation became ample for the first time in years, and rented basement rooms were abandoned.

The total cost of the system for maintenance was $2,638,010. About 90 per cent of the cost of the schools comes from local taxation. The Board's estimate of the amount necessary is submitted to the City Tax Commission for approval, but the Mayor and Council do not pass on it. E. P. C.

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Annual Reports Cleveland Public Schools, 1837 to date. See especially *Report* for 1909 which marks a distinct advance in school reporting in accord with the best theories of the day on the subject.

ELSON, WM. H. Cleveland Public Schools, *Elem. School Tr.*, June, 1908, Vol. VIII, pp. 568–575.

CLEVELAND PLAN, THE.—A term applied to the form of school government instituted in Cleveland in 1892, and recommended substantially in the Cleveland form in the report of the subcommittee on the organization of city school systems of the Committee of Fifteen (*q.v.*) of the N.E.A., in 1895. The plan has frequently been termed the "Federal plan," because of the double authority involved. The essential features of the plan were as follows: A School Council, or Board of Education, of seven members, elected at large for two-year terms, were, in connection with a School Director, to have entire charge of the schools of the city. All legislative power and authority were vested in the School Council. It provided for the employment of all teachers and employees, and fixed their compensation; adopted textbooks; approved all contracts for more than $250 for general expenses, and for more than $1500 for repairs; made all appropriations; and adopted general regulations of a legislative nature. The members of the Council were to be paid $260 a year for their services.

A School Director, also elected by the people for a two-year term, acted as the chief executive officer. He attended all meetings of the School Council and participated in the proceedings, but had no vote. All acts of the School Council, however, which involved the expenditure of money or the purchase, sale, lease, or transfer of property, or the levying of any kind of a tax, or the change or adoption of any textbook, required the approval of the Director also, though his veto could be overcome by a subsequent two-thirds vote of the School Council. The School Director could make contracts and purchases up to $250 at any time. He selected and nominated the Superintendent of Instruction to the School Council, and appointed or employed all employees of the school department except supervisors and teachers, who were nominated by the Superintendent of Instruction. The heads of the executive departments, apart from the Superintendent of Instruction, were a secretary, clerk, Superintendent of Buildings, truant officer, chief carpenter, and an Attorney. The Director devoted all of his time to the work of his office, and was paid a salary of $5000 a year. He accepted or rejected all bids, approved the purchase of all supplies, determined the fitness and competency of all employees, and was charged with the execution of the general laws and of the rules and regulations of the School Council.

The Superintendent of Instruction, nominated by the Director and confirmed by the Council, held office during good behavior. To him was given the sole power to appoint and discharge all supervisors and teachers. He reported to the School Director concerning all matters under his supervision.

The Cleveland law aimed to secure a complete separation of legislative and executive functions; to define clearly the powers and duties of each department; to introduce good business methods into the management of the schools; and to concentrate and fix responsibility. The city was fortunate in the selection of its first School Director, and for a time the system worked well. The double system of checks was at first regarded as a great merit of the system. A plan of organization essentially the same as the Cleveland plan was approved by the majority of the subcommittee of the National Education Association, and the merits of the Cleveland plan received much notice in the educational press for some years.

After ten years of trial the merits and the defects of the Cleveland plan became more apparent. The idea of separating the legislative and executive functions has been generally accepted as a wise change, and has been more or less completely adopted in almost all of the reorganizations of city school systems which have taken place during the past fifteen years. The position of School Director, or Business Manager, has also been incorporated in some form or other in nearly all of the recent revisions. The election of the School Director by the people, however, has not been accepted by other cities, and, in 1904, was discarded as unsatisfactory by Cleveland itself. The Business Manager ought to be a business expert, and business experts of any kind cannot be obtained with any success by popular election. The plan of allowing the Business Manager to appoint the School Superintendent and pass on his competency and efficiency eventually worked disastrously in Cleveland, and has not been tried elsewhere. The plan of giving the Director a power of veto on the acts of the Board, thus establishing a system of checks and balances, has also been discarded as unwise. To secure efficient school administration some one must be given power and be trusted, and the proper body to receive such power is the Board of Education. The reorganization accomplished in Cleveland, under the law of 1904, remedied the bad features, while retaining many of the best features of the original plan. (See Cleveland, City of, for present plan. Also see article on City School Administration.)

The Cleveland plan of 1892 was a pioneer, and marked a distinct advance toward proper business and educational management for our large city school systems. It naturally contained imperfections which time would correct, The report of the Chicago Educational Commission (*q.v.*) was in part framed, and the more recent reorganizations of the school systems of Boston and St. Louis have been accomplished, in the light of Cleveland's experiences.

E. P. C.

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Taylor, Mrs. B. F. Discussion on the working and outline of the Cleveland plan, in *Proc. N. E. A.*, 1897, pp. 971–974.

CLIAS, PHOKION HEINRICH (1782–1854). — One of the pioneers of the physical education movement in Switzerland; was born in Boston as the son of a Swiss. From 1806 to 1811 he taught gymnastics in Holland, Germany, and Switzerland. In 1814, as officer of artillery in Bern, he introduced physical training in his company. In 1815 he became director of the physical training at the academy in Bern; in 1817 he went to Paris, where he published his *Gymnastique élémentaire*, a graded course of exercises for the developing and strengthening of the human organism. His book was approved by the Paris Society of Medicine. In 1822 he was called to England, where he was made Superintendent of Gymnastics at the military and naval schools of Sandhurst, Woolwich, and Greenwich. In 1827 he returned to Switzerland, and from 1841 to 1848 he taught gymnastics at Besançon and Paris. He died at Coppet, Switzerland. Among his works are: *Anfangsgründe der Gymnastik oder Turnkunst* (*Elements of Gymnastics*), Bern, 1816, which is largely influenced by Guts Muths' (*q.v.*) *Kalisthenic oder Übungen zur Schönheit und Kraft für Mädchen* (*Calisthenics, or exercises for the development of beauty and strength in girls*), Bern, 1829, the first German work treating of physical training for girls; *Traité élémentaire de gymnastique rationelle* (Geneva and Paris, 1853).

F. M.

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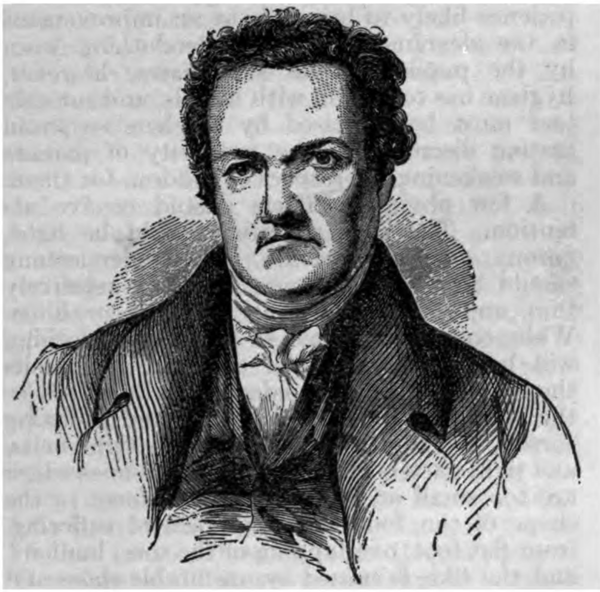
Meili, F. Phokion Heinrich Clias, sein Leben und Wirken, in *Deutsche Turnzeitung*, 1879, Nos. 1 and 3.

CLINICAL INSTRUCTION. — See Medical and Surgical Education.

CLINTON COLLEGE, CLINTON, KY. — A coeducational institution organized in 1874. Primary, academic, collegiate, normal, and musical departments are maintained. The requirements for admission to the college are indefinite. Degrees are conferred. There is a faculty of fifteen instructors.

CLINTON, DE WITT (1769–1828). — Statesman; was born at Deer Park, N.Y., on Mar. 2, 1769, and was graduated from Columbia College in 1786. He took up the practice of law, and in public life took a leading part in the educational affairs of New York city and state. While mayor of New York City (1805) he was active in the organization of the "Society for Establishing a Free School in the city of New York for the education of such poor children as do not belong to, or are not provided for by, any religious society," and for twenty-one years he was the president of this society. While governor of New York (1817–1822 and 1824–

1828) he was unusually vigorous in the advocacy of measures looking to the improvement of the common schools. He was also active in the Infant School Society of New York (*q.v.*) and the Presbyterian Society for the Promotion of the Education of Youth (*q.v.*). He was secretary of the Board of Regents of the University of the State of New York from 1794 to 1797. Governor Clinton died at Albany on Feb. 11, 1828. W. S. M.



De Witt Clinton.

See also article on NEW YORK, EDUCATION IN.

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CLOAK ROOMS. — See ARCHITECTURE, SCHOOL.

CLOISTER SCHOOLS. — *Kloster Schule* is a German term for the school of the novices and *oblati* in a monastery. It seems to make its first appearance in Ekkehard IV's account of the school at St. Gall in Switzerland; where the *schola claustralis* is distinguished from the *schola canonica.* It is by no means clear from his account whether the latter means the bishop's cathedral school or an assumed "outer school" of the monastery, for canons' or secular and lay persons' children. But the whole account, written 200 years after what it purposes to describe, is too romantic to be entirely acceptable as an authentic account of what went on at St. Gall. If the writer meant to describe the monks as teaching a school for outsiders within the precinct, the account is in direct conflict with the law, and without independent contemporary evidence cannot be accepted. The inner novices' and oblates' school is accurately enough called the cloister school, as in historical times it was held in the cloister, and when the cloister was, as was generally the case where the lie of the ground and other circumstances permitted, to the south of the church, the school was in the northwest corner. At Westminster the place of the school in this position is still marked by the solitaire boards carved in the stone seats running round the cloister. It was the warmest and sunniest spot in the cloister. At Canterbury, where the cloister is on the north, the school was at its southwest angle. The school was not so much a school of learning as a school of the rule of the order. The master was called *magister ordinis*, and his chief duty was supervision and the teaching of the rule by heart and its observance in effect. In the eleventh century constitutions of Lanfranc for the government of monasteries elaborate directions are given as to the custody of the *oblati*, children offered by their parents and being bred up in the monastery. They are never to be allowed to speak to a monk except the abbot or prior, or by special leave of the abbot, and in the latter case the master is to sit between the speaker and the boy. In general they are to sit so as not to touch each other or let their clothes touch each others'. They must not make a sign or speak to each other without leave. Out of school they may only talk to each other so that the master can hear every word. The same stringent rules apply to them when they cease to be boys and become youths, *i.e.* over 14, and to those who then newly come from the world to become monks. Not a word in either case is said as to what they are to be taught, the only thing specifically mentioned being reading; though elaborate provision is made for their singing with their master all night round the corpse of a dead monk. Of course reading and singing and understanding the rule implied the teaching of sufficient Latin to do these things. But the merest modicum of Latin sufficed. When we find Papal Bulls in 1304 and 1335 issued to impress on the monks the necessity of learning and ordering them to have grammar masters, seculars, if need be, introduced to do so; when we find bishops so far apart as Wykeham (1383) and Warham (1504) complaining that the monks of their cathedral monasteries, the premier churches of the kingdom, Canterbury and Winchester, made havoc of the lessons in church by false quantities and through not understanding what they were reading, and ordering them to provide secular grammar masters; when in the visitations of Norwich diocese, 1495–1504, complaint is made in almost every monastery of the neglect of learning and the lack of schooling; and when we regard the account given by Chaucer of the monk "why should he study to make himself woode," — it cannot be supposed that the cloister school was a house of learning in any but the most meager and perfunctory sense. Even when the colleges were set up for them at the end of the thirteenth century and Papal statutes were passed in 1335 ordering under stringent penalties each Benedictine monastery (and a year or two afterwards the same was applied to the Augustinian canons' houses) to send 5 per cent of each house to the university, even the greatest monasteries failed to obey the statutes in their integrity, and many did not obey them at all. Regarded as schools, too, the cloister schools contained so few students that they were not a school at all in our sense of the word. Even in the great cathedral monastery of Durham the writer in Elizabethan days of the *Rites of Durham*, who pours *couleur de rose* over everything, says that there were only six at a time in the novices' school, and they must of course have been of very different ages. In the obedientiary Rolls of Winchester there were sometimes none at all in the youths' school, as it was called, and never more than ten. The cloister school looms large in late writers, especially among the *laudatores temporis acti*. Except in the Carolingian epoch, it was a small and insignificant thing, and had no influence on the general public, and contributed little to the advancement of education in the world.

A. F. L.

See Convent Schools; Monastic Schools; Monastic Rules, Educational Provisions in.

CLOSETS, SCHOOL. — See Latrines.

CLOTHING OF SCHOOL CHILDREN. — The kind of clothing for school children must be determined by many considerations, such as the custom of the community, the climate of the locality, the temperature likely to be found in the homes, and the temperature of the schoolroom. Only the most general hygienic rules can be given. It seems better, however, that the schoolroom should be at a relatively low temperature, not more than 68° F., and that the children should be sufficiently clothed so as to be comfortable at such a temperature. While the children of the poor are often too thinly clad, a common fault among the well-to-do is that of clothing their children too warmly. The result of the overheating of the body in this way is weakening; it is likely to retard school work, and on exposure to drafts colds are liable to be contracted.

On the other hand a child should not be exposed to the cold by insufficient clothing. It is estimated that more than 80 per cent of the heat generated in the body is given off by the skin, and on account of the relatively greater surface of the child's body as compared with that of the adult this irradiation of heat from the skin is relatively greater in case of the child. This fact offsets in part the greater functional activity of the child's body.

The difficulties encountered by teachers in regard to the clothing of children are liable to be serious. Some children are clothed too warmly, others too lightly; the clothing of many is dirty; and in some cases the atrocious habit of sewing children up for the winter prevails. Until the community is better educated, the best method seems to be that of having school baths, which is a sure remedy for the sewing up habit; and according to German experience likely to bring about an improvement in the cleanliness of the underclothing worn by the pupils. In all such cases, however, hygiene has to reckon with morals, and suitable tact must be exercised by teachers to avoid casting discredit on the authority of parents and weakening the respect of children for them.

A few obvious matters should receive attention. The head covering should be light, porous, and convenient. The underclothing should be, even for severe climates, relatively thin, and should be either of wool or linen. White color is desirable, so that soiled clothing will be easily seen. All clothing that binds the body should be avoided, — tight collars or the like about the neck, inflexible and ill-fitting corsets, too tightly fitting drawers, tight belts, and tight garters and stockings, and shoes which are too small or which do not conform to the shape of the foot. A great deal of suffering, from flat foot, overlapping of the toes, bunions, and the like, is caused by unsuitable shoes and stockings. It is especially necessary that the foot clothing should be of such kind that the toes move freely and that no distortion of the foot is produced.

The essentials of suitable clothing for children can be summed up, then, in a single sentence. The clothing should be loose, should not bind any of the organs of the body, and should give opportunity for free muscular movement; it should be simple, and warm or thin according to the climate, and of such a character that it can be kept clean.

W. F. B.

See Nutrition; Outdoor Schools.

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CLOUGH, ANNE JEMIMA (1820–1892). — Founder of Newnham College (*q.v.*), Cambridge, England, 1871, and prominent supporter of the movement for education of girls. In 1873–1874 she was president of the North of England Council for the Promotion of Higher Education of Women, an association of which she had previously been the secretary.

CLOVESHOO, COUNCIL OF. — The Provincial Synod at Cloveshoo, near Rochester in Kent, held in the year 747 and attended by Cuthbert, Archbishop of Canterbury, and other bishops, is of great importance in the history of English education, as at this council the first extant Saxon canon or enactment relating to English education was promulgated. The seventh canon was an organized effort to disseminate through the land the educational ideals introduced by Theodore (*q.v.*) and Adrian (*q.v.*) eighty years before. It is important to note that the canon clearly refers to the education of girls as well as boys, and that it is addressed to bishops as well as heads of houses. It should be considered as the connecting link between the work of Theodore and that of Alcuin (*q.v.*) and of Eugenius II. The canon is entitled, " Concerning the study of reading throughout the single monasteries," and runs as follows: " That the Bishops, Abbots, and Abbesses should strive with every endeavour and diligently look to it that throughout their households many may spread abroad and very many may assiduously pursue the study of reading to the profit of their souls and the glory of the eternal king. For with lamentation it must be said that very few persons are now to be found who in their inmost hearts are ravished with the love of sacred learning. Men will scarce spend any labour in learning, nay rather are they possessed from their youth up with all manner of vanities and with the lusts of idle glory, and, in the error of their hearts, rather follow after the instability of this our mortal life than the steadfastness of the Holy Scriptures. Therefore let children everywhere in the schools be compelled to address themselves to the love of sacred learning that they may be found henceforth well instructed, so that they may render to the church all manner of service and that the Honor of God may not, through the devotion of the governors to the works of this world, be brought into derision and left bare of spiritual ornament." (For Latin text, see Haddon and Stubb's *Councils and Documents relating to Britain and Ireland,* Vol. III, pp. 364–365.) J. E. G. DE M.

See ABBEY SCHOOLS; CLOISTER SCHOOLS; CANON LAW, EDUCATION IN.

CLUNY. — A Benedictine monastery established near Macon on the borders of Burgundy in 910 by William of Aquitaine. Berno was the first abbot, and was succeeded by Odo, who spread far and wide the influence of Cluny, which stood under reformed rules. Cluny was one of the wealthiest of the monasteries of that age. A cloister school was maintained in connection with the monastery, and great care and vigilance was exercised over the pupils of the school. St. Ulric, who wrote the *Customary* describing the rules of the house, says, " I think it would be difficult for a king's son to be brought up in a palace with greater care than the humblest boy enjoys at Cluny." Although Odo is known to have had a knowledge of Vergil, Priscian, St. Augustine's *Dialectica,* and Capella, and some acquaintance with Greek, he exercised his influence against the reading of the classics, and for a long time this position was maintained not only at Cluny but at other monasteries affected by it. Still much copying of manuscripts was done by the monks.

COAKLEY, GEORGE WASHINGTON (1814–1893). — Educator and textbook writer; graduated from Rutgers College and was subsequently professor of mathematics at St. James College (Maryland) and New York University. Author of textbooks on astronomy and physics. W. S. M.

COBURN, CHARLES RITTENHOUSE (1809–1869). — Schoolman; educated in the common schools of Pennsylvania, and for 30 years principal and superintendent of schools in that state. He was editor of the *New York Teacher* from 1852 to 1854 and superintendent of public instruction in Pennsylvania from 1863 to 1866. W. S. M.

COCHIN CHINA. — See FRENCH COLONIES, EDUCATION IN.

COCHRAN, DAVID HENRY (1828–1909). — Educator; graduated from Hamilton College in 1850. He was instructor of science in the Clinton Liberal Institute, the Fredonia Academy, and the State Normal School at Albany, and principal of the latter institution from 1855 to 1864. From 1864 to 1900 he was president of the Brooklyn Polytechnic Institute. He was active in the evening school movement and in the work of humane societies. W. S. M.

COCKFIGHTING IN SCHOOLS. — It is difficult to find a complete explanation of the once almost universal practice of cockfighting in schools on Shrove Tuesday. It existed from very early times in England, Scotland, and France. Cockfighting seems to have been introduced from the Mediterranean before the Roman invasion, and it may with some reason be suggested that cockfighting was one of the many customs that was handed down from the Roman Imperial Schools to the schools of England and France (cf. the Roman school holiday, *Quinquatria,* on Mar. 20). A very early account is contained in the famous *Description of London* written by William Fitzstephen (who died *c.* 1191) in the second half of the twelfth century. His account runs as follows: " Furthermore in each year on the day which is called Shrove Tuesday, to begin with the games of boys in London (for we have all been boys), each boy in the school brings a fighting cock to his master, and the whole of that forenoon is given up to a holiday to watch the cockfights in the school. After dinner all the scholars go to a field outside the town to the well-known game of ball. The scholars in each of the courses have their own ball." In England the custom extended to adults, but in France it was limited to schools and was at last forbidden in grammar schools by cap. 7 of the Council of Copria (Cognac?) in 1260 (see Du Cange's *Glossary,* Vol. II, 1679). For descriptions of Shrovetide cockfighting in Scottish schools see

Northern Rural Life by Dr. William Alexander (ed. 1888, ch. xxii). It was abolished in Wemyss school in 1748 by John Grub, but survived in Scotland at any rate till 1820. It existed at the Manchester Grammar School at least as late as 1815 (see *Notes and Queries*, 8th Series, Vol. VII, pp. 338, 473–474). At the Wreay Free School (near Carlisle) there was a cockfight on Shrove Tuesday for a silver bell from the year 1655. This was abolished in 1786 (Carlisle, *Endowed Grammar Schools*, Vol. I, p. 205). The silver bell was also fought for at Bromfield school (see Hutchinson's *History of Cumberland*, Vol. III, p. 322). Cockfighting was forbidden by the statutes of St. Paul's School of 1518. The *Cock-penny* is associated with the school cockfight, and this gratuity to the masters (which resembles the gratuities paid to teachers in the Roman Imperial Free Schools) is an additional reason for connecting the cockfighting with Rome. At Lancaster School the cock-penny was paid by the free scholars at Shrovetide. The master took seven twelfths and the usher five twelfths of the proceeds. The cock-penny was also paid at Hawkshead School, Clitheroe School, Burnley School, Wye School (see Brand's *Popular Antiquities of Great Britain*, Vol. I, p. 72 and p. 431). At the very ancient school of Whitcham and Millom in Cumberland tuition was quite free except a gratuitous offer, entirely at the option of the parents of the children, called a "Cock-penny" at Shrovetide (Carlisle, *Grammar Schools*, Vol. I, p. 198). The ancient rate-supported grammar school at Crosthwaite or Keswick was a cockfighting school (*ibid.*, Vol. I, pp. 178–180). Cockfighting is related in some way to the ancient school *saturnalia* called "Barring Out" (*q.v.*). This took place three days before Lent. The master was deposed and excluded from the school. Cockfighting and football followed. This was at Bromfield School (see Hutchinson, Vol. III, 322, and Brand, Vol. I, pp. 441–454). Barring out was a common practice (see Durham, Houghton, Le Spring, and Lichfield schools; Brand, Vol. I, p. 441; II, p. 71). The whole business is clearly of classical, probably Grecian origin. In Germany the practice of presenting the teacher with a cock or monetary equivalent on Palm Sunday was frequent, as well as a gift of money before each holiday. (See Fischer, *Geschichte des deutschen Volkschullehrerstandes*. Berlin, 1898.) J. E. G. de M.

COCKER, EDWARD (1631–1675). — An English teacher famous for his arithmetic text book, which is supposed to date back to 1664, and is said to have gone through 100 editions (*Dict. Nat. Biog.*). He was considered to have laid down the law with regard to arithmetic so that the expression "According to Cocker" has become familiarized to express a statement which is too authoritative to be contradicted. On the value of Cocker's book and the question of its authorship, see De Morgan's *History of Arithmetical Books*, p. 56. The copies now found are revised by John Hawkins, writing master in Southwark, and issued under the title *Cocker's Arithmetick*, licensed Sept. 3, 1677, who states that the work proceeds from the " author's correct copy " which may mean that it had previously been in Ms. till published by Hawkins. At any rate it is printed with Edward Cocker's Preface. " Practical Arithmetic," he says, " is the soul of Merchandise," and he has throughout considered " the numerous concerns of the honored merchants." The book is also intended for teachers, " whose understandings soar to the sublimity of the theory and practice of this Noble Science." John Collins, a famous mathematician of Hawkins' time, and fifteen (chiefly) teachers recommend the book, which is, they say, " generally approved by all Ingenuous Artists." As to the *practical* nature of Cocker's book, Mr. Ball says (*Short History of Mathematics*) that " until the time of Cocker (1677) there was some discussion of the principles involved; since then, very few arithmeticians have attempted to justify or prove the processes used, or to do more than enunciate examples and illustrate their use by a few numerical examples." Cocker also compiled an English dictionary.

Cocker was a writing master by profession, and in his own day had much more renown as a teacher of writing than of arithmetic. He published over a score of manuals of penmanship. On his merits as a writing schoolmaster, see Wm. Massey's *Origin and Progress of Letters* (1763). F. W.

COCKERTON JUDGMENT. — A *cause célèbre* in English educational law and administration. In order to supply the lack of secondary schools the practice had grown up toward the end of the nineteenth century by which school boards instituted classes for adults and children in evening and day schools in subjects beyond the curriculum of the elementary school. These courses were maintained out of the public rates and received grants from the Science and Art Department. The result was that elementary schools practically were under the dual control of the Education Department and the Science and Art Department. In 1900 Mr. Cockerton, district auditor under the Local Government Board, refused to allow certain expenditures on classes beyond the elementary school curriculum which had been incurred by the London School Board. The case was taken to the law courts, and the Court of Appeal upheld the decision that the school boards had acted beyond their powers in maintaining higher education out of public rates.

The immediate consequence of this judgment was to draw public attention to the inadequate provision of secondary education. By the Education Act of 1901, authorities were permitted to continue for a year any school which had violated the law. The Education Act of 1902, however, remedied the confused state of things by empowering local authorities to raise money for secondary and evening continuation schools.

It was further brought out during the proceedings on this case that nowhere in the English Education Acts was there a definition of elementary education. The act of 1902, however, remedied the deficiency by defining the elementary school and its scope.

See England, Education in.

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CODRINGTON COLLEGE, BARBADOES. — See West Indies, British, Education in.

COE COLLEGE, CEDAR RAPIDS, IOWA. — A nonsectarian, coeducational institution, originated in a school kept in his own house by Williston Jones, a pioneer Presbyterian pastor in eastern Iowa. In 1853, upon the solicitation of Mr. Jones, Daniel Coe, of Durham, N.Y., gave $1500 to the school, which had been incorporated in 1851 as the " Cedar Rapids Collegiate Institute." In 1867 the name was changed to " Parsons Seminary," and a main building was erected. In 1871 the name was again changed, this time to the " Coe Collegiate Institute." In 1880, chiefly through the efforts and gifts of a trustee, Mr. Thomas M. Sinclair, the institute became free of debt, and was placed under the control of the Synod of Iowa, North. The name became Coe College, and the institution was made of college grade in 1881. From Oct. 31, 1893, the charter prescribed that the Synod of Iowa should have a veto power over the election of the 10 members chosen annually by the board of 30 trustees. On June 9, 1908, the Board passed an amendment accepting action by the Synod, which relinquished all control over the election of trustees. Coe College was then accepted by the Carnegie Foundation for the Advancement of Teaching (*q.v.*) as a nonsectarian institution participating in its system of retiring allowances to professors. Since 1881 the presidents have been: Stephen Phelps, 1881–1886; James Marshall, 1887–1896; S. B. McCormick, 1897–1904; and W. Wilberforce Smith, 1905–1908.

The year 1901–1902 was devoted to efforts to increase the productive endowment of the college by $150,000, stimulated by a conditional gift of $25,000 from Mr. Ralph Vorhees of New Jersey. Immediately following the success of these efforts, funds were obtained whereby, in 1904, the gymnasium was built and equipped, and the president's house was rebuilt. In July, 1907, there closed another campaign based upon conditional donations of which the largest were $45,000 (later increased to $63,500) for a Science Hall, from Mr. Andrew Carnegie, conditional on raising $45,000 for a new science endowment ; and $50,000 for endowment from the General Education Board, conditioned on securing a total of $250,000, besides paying the debt which accumulated during the years of effort for endowment and amounted to $43,000 by the close of this campaign. The full amount raised was in excess of $293,000.

The productive endowment is $237,123.75; the total annual income is $28,137.44. There is an outstanding debt of $28,800. The average salary of a professor is $1270. There are (1909) 30 members on the instructing staff, of whom 12 are full professors. The student enrollment is 338, divided as follows: college, 243; academy, 75; summer school, 47. C. G.

COEDUCATION. — Historically, public education has first developed for the service of boys. The training of girls has been a secondary consideration, or rather the education of girls was left to the home and church. Consequently the first colleges, secondary schools, and academies were established for boys. A notable instance of this is the German gymnasium, which only in very recent years has been developed for girls. Until well along in the nineteenth century, girls were regarded with disapproval in many American schools. When, therefore, the equal right of girls to public education was asserted, it was found that there were only boys' schools, and the demand for educational opportunities for girls was of necessity often a demand for coeducation. As a result of this demand, girls gradually made their way into the various departments of the school system. During the latter part of the nineteenth century, especially, this movement became very strong, and the desirability of coeducation was much discussed. Since the results vary extensively according to the grade of education concerned, it may, perhaps, be well to treat the subject from the point of view of each of the three great divisions of education.

In Elementary Schools. — In Germany coeducation has existed in elementary schools, to some extent at least, from the time of the Reformation. By the law of 1871 in Prussia, the Volksschulen were advised to separate the sexes wherever possible, except when there were only two teachers in the school. However, three tenths of the city school children are in mixed classes, and in the rural schools, inasmuch as the separate plan is too expensive for most country districts, two thirds of the children are in classes for both sexes. In France each commune having more than 500 inhabitants must establish a separate elementary school for girls, unless a mixed school is sanctioned by the provincial council. As a matter of fact, there are comparatively few coeducational schools in France, even in elementary education. The number of these seems, however, to be very slowly increasing. In Switzerland the elementary schools are for the most part coeducational, but in some cantons the course of study varies both in character and in length for the two sexes. In Sweden practically all the elementary schools are for both sexes. In Austria as many as 85 per cent of the public elementary schools are coeducational. In Italy about one fifth of such schools admit both sexes, and the law requires that if the sexes use the same building, they should have separate entrances and classrooms. In the lowest classes, however, this principle is frequently disregarded. Just as Italy aims to avoid coeducation, so do all the Romance nations, with the partial exception of France. Spain and the Spanish-speaking states of America do not favor mixed schools. In Brazil a limited experiment in coeducation in elementary schools was tried in a few schools, but the plan was abandoned. In England the extent of coeducation in public elementary schools has been steadily increasing. In 1908 more than 65 per cent of the departments into which these schools are divided have mixed classes. In Scotland 97 per cent of such departments are coeducational. In Ireland over 50 per cent of the public elementary schools are of this character. In Canada, except among schools for the French, and in Australia, except for a few city schools, coeducation is the rule in elementary education.

In the United States coeducation even in elementary education has grown up since the Revolution. For the most part in colonial times the girls gained whatever education they received from dame schools, special classes, the instruction of tutors, or various irregular methods (see COLONIAL PERIOD IN AMERICAN EDUCATION). In the latter part of the eighteenth century the plan of coeducation crept into the academies, as it had earlier into the elementary schools of New England, and ultimately it came to be the practice in public schools in general. To-day at least 96 per cent of the elementary pupils are in mixed schools. Only in a few large cities like New York is any attempt made to separate the sexes in the lower grades of instruction. Even here the separation is made on grounds of convenience in administration, discipline, etc., rather than because it is felt that separate education is the ideal method.

In general, therefore, so far as the United States is concerned, no question exists as to the feasibility, or, indeed, the desirability of coeducation up to the time of adolescence. Thus only for the last two years of elementary education can the issue of the wisdom of such education be regarded as serious. Moreover, if, as many think, these years are ultimately to be regarded as properly belonging to the secondary school, then the serious debate in regard to coeducation concerns secondary and higher education rather than that of the elementary grades. This view seems to be that to which other countries with advanced systems of popular education have been gradually coming, if they have not already reached it. Communities in which elementary education is as yet not well advanced, or in which the ages of maturation of the sexes and of marriage are early, have as yet not become favorable to coeducation even in elementary education.

In Secondary Schools. — Coeducation in the American secondary schools is the result of two conditions: (*a*) the rise of a well-defined demand for equal opportunities for the education of girls with that of boys; (*b*) the need of economy of administration in the newer communities. The first was largely contemporaneous with the development of public high schools. The consequence is that, outside of certain large cities like Boston, Baltimore, New Orleans, San Francisco, and New York, coeducation practically prevails wherever public secondary schools are found.

Since the attendance on private schools in the United States is almost stationary and the public high schools are increasing rapidly, it is statistically true that coeducation is increasing in the United States. In 1906–1907 there were in the United States 678,000 children in coeducational public schools, and 45,000 in noncoeducational public schools; in private secondary schools, including those under religious auspices, there were 57,000 children under conditions of coeducation, and 49,000 in separate schools. For a series of years there has been almost no increase in public noncoeducational schools; whereas, nearly all new private schools have been founded for separate education.

In Great Britain, excepting Scotland and parts of Wales, separate education is almost the universal practice in the secondary schools; this is often true as well in the day secondary schools which are now being established, and also in the boarding schools which generally prevail. In a few cases small coeducational boarding schools exist, but they are still regarded as experimental. Scotch secondary education, for reasons analogous to those which prevail in the United States, has long admitted coeducation, and apparently without harmful results.

In Germany and France almost no coeducation exists in secondary schools. In Germany, as is well known, secondary education for girls is of very recent development, and almost universally is found in separate institutions.

Certain evils, once apprehended from coeducation, have not been realized. Girls have not proven intellectually inferior to boys, or unable to cope with the studies taken by the latter; they have not suffered physically as a result of the supposedly increased effort necessary to keep pace with the boys in their studies. Coeducation has not promoted early marriage, nor is it in evidence that it has tended to retard it; it has had no visible results in the way of impairing moral conduct.

The old objections to coeducation for children of secondary grade have proved groundless.

The problem has been for a number of years at rest in the United States; within recent years, however, it has been reopened, partly by the contributions of Dr. Hall. Changing conceptions of education, and an increased appreciation of adolescent development, have given rise to a number of questions which are still in process of discussion. The following arguments are being presented against coeducation in this discussion: (*a*) Coeducation renders difficult or impossible a suitable differentiation of studies, according to the physical, the vocational, and other needs of each sex. This assumes that education becomes, instead of merely a matter of mental discipline, a process equipping individuals with the ideas and training needful for the performance of their individual and social duties; it assumes that the social needs of women will differ somewhat from those of men. (*b*) In the secondary school period, that of adolescence, it is alleged that coeducation prevents the development of certain finer feminine qualities in the girl and some desirable virile qualities in the boy; from this point of view it is desirable that during the period of adolescence the sexes should go off apart, each developing individual qualities, and not suffering from contact with the other. This is a modified form of an older argument, and its validity is yet uncertain. It is evident that boys dislike to work in competition with girls, partly because of the precocity and earlier self-confidence of the latter. In the American secondary public schools nearly 60 per cent are now girls, and it is alleged that this preponderance is partly due to the lack of interest on the part of boys in the studies in which they compete with girls. It may be further noted that in large coeducational schools it is the belief of many principals that the social life becomes too intense, and acts as a deterrent to study. (*c*) While girls have not only proven equal to boys in their capacity to respond to the secondary school curriculum, but have even, in many cases, outstripped them, there still arises the question as to whether the physical health of the girl may not be permanently impaired by too close devotion to a program of studies designed for boys. The girl's capacity is undoubted, but her increased conscientiousness, and her inability to give practical interpretation to studies like mathematics and science, may easily render these sources of overwork to her.

Among the arguments which still seem valid for coeducation in secondary schools are these: (*a*) In all stages, and except in very large cities, it is more economical; it makes for democracy and equality between the sexes; it promotes the capacity and coöperative powers of men and women workers — an important fact, since in the United States more than 5,000,000 women now follow gainful occupations in coöperation or competition with men. (*b*) In the adolescent period, it undoubtedly promotes a wholesome disillusioning as regards the relations of the sexes, and makes more possible informal intercourse such as business and social life require. It is a generally accepted belief in England that the coeducational schools have a more wholesome moral atmosphere than those on the separate basis.

Certain tendencies now at work in public secondary education are undoubtedly destined to give new aspects to the problem. (1) Modern education, especially of secondary grade, is rapidly widening; and its expansion follows four well-defined lines: physical education, vocational education, social or civic education, and cultural education. In the first two divisions co-instruction is, of course, largely out of the question. Standards, aims, etc., will vary widely. In the third, the content of the wider civic or moral education will certainly differ for boys and for girls in well-defined particulars; but in others it will be identical. Furthermore, the life of the school and its associations are a large element in social education. In cultural education there is no reason why the content and method should not be the same, with the proviso that a considerable part of secondary school mathematics, science, and art will be developed along vocational rather than cultural lines. (2) Secondary education will probably be pushed down into two years, therefore including the time in which boys and girls have most divergent development. (3) Owing to the large amount of new material to be incorporated into the high school course, flexibility in the shape of elective courses or subjects will doubtless tend to increase. (4) Again it must be noted that schools are increasing in size, thus making an institution resemble an aggregation of departments brought together for economy of administration, but not necessarily involving more than partial contact of all the members.

Secondary education tends also to begin earlier, and to approximate a period of six rather than four years. The consequence of these developments will probably be an extension of coeducation, but a measurable diminution of the necessities for more than partial contact in the schoolroom.

In the public high school of the future we may expect that certain classes will be pursued exclusively by the girls, and others by the boys; but that certain other studies, for economy of administration and social reasons as well, will be followed by both girls and boys. Under these circumstances, different tastes and interests will be consulted, and the necessities for physical overwork will be diminished. Each sex will have a curriculum adapted to its needs, but will be educated to a certain extent in the atmosphere of the other, thus combining the opportunities for moderate social intercourse with opportunities for the pursuit of studies along distinctive lines. (See also WOMEN, HIGHER EDUCATION OF.)

In Higher Education. — So far as university instruction is concerned, it is evident that women are being admitted into the institutions of the world wherever a strong demand has appeared on their part for such an opportunity. For such instruction coeducation has seemed the only method at all available. The expense of university instruction makes separate provision for women practically out of the question. The number of women who wish graduate or professional instruction, save for the purpose of preparing for teaching, would seem to be relatively small as compared with those who wish secondary education, which for the purpose of this discussion may be regarded as including in the United States collegiate education. Moreover, in the higher work of the university the maturity of the students and their intellectual attainments would seem to make the scholastic purposes of their common work so dominant as to exclude any disturbing influences from the association of the sexes. On the other hand, in the secondary schools since the students are more immature in character, since they are in the adolescent stage of development, when the interest in relations of sex is especially strong, and since the number of women wishing instruction is so great as to make separate schools possible, the question of the wisdom of coeducation is yet a living issue. In the United States, as we have seen, the high schools have become practically all coeducational. The struggle centers about the advisability of coeducation in the colleges, where the practice of the West is dominantly coeducational, while that of the North Atlantic states as yet favors separate instruction. In Europe secondary education has scarcely attempted coeducation even as an experiment.

E. N. H. AND D. S.

See WOMEN, HIGHER EDUCATION OF.

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COEDUCATION, HYGIENE OF. — In small country day schools coeducation is unavoidable, but there the conditions of living are healthier than in big cities, overpressure in education is hardly in question, and for the ages of children in the lower grades the differences in the development of secondary sexual characteristics and qualities are of no great importance. It is a different matter in the high schools, and it is these only which are taken into consideration in the following remarks. (The European high schools quoted in the preceding article are day schools, only partly coeducational, and corresponding to high school and lower college classes combined in the eastern part of the United States.)

Investigation shows clearly a difference between the bodily resistance of the two sexes. After the way had once been opened by Hertel's work, the great investigation made in Sweden by Key in 1885, etc., proved that ailments were much more prevalent amongst girls than boys, though the latter were more burdened by school work. The investigation in a coeducational school in Finland (1896–1898) showed more school days missed by the girls than by the boys; the Helsingfors investigation (1890) and a later one made in eight small Finnish towns (1900), both in coeducational schools, also showed many more girls than boys exempt from obligatory gymnastics in consequence of medical examination.

A special difficulty in the question of coeducation arises from differences in the curve of bodily development. The Swedish investigations mentioned above show not only in all ages a higher rate of illness amongst girls, but also that the curve of ill health makes different oscillations at different ages in the case of boys and of girls; and a Helsingfors examination (1890–1891) shows that in the ages above 12 years, the increase of weight during the year differs in the two sexes and takes place with the girls principally during the holidays. The minor mass development of skeleton and musculature makes girls less able to resist certain noxious influences. With regard to gymnastic drill that difference has been taken into consideration for a long time now, independently of the question of coeducation. There is also difficulty in psychical respects. From the experience gained from the Antwerp investigations made by Schuyten we see that in coeducational schools with a heavy curriculum girls are likely to be more burdened than boys in consequence of the greater suggestibility of the girls. Other investigations have shown that boys and girls at different ages have different psychical ability.

So far as accurate investigation gives us reliable results, we see that ill health is much more prevalent amongst girls than boys during the development of puberty and the years immediately following, though that process itself, which is of great importance for the future life and for future generations as well, is really physiological, and can doubtless be passed through in a healthy way with reasonable care and attention to hygienic laws during childhood and also at the period in question.

Notwithstanding all these difficulties, coeducation is becoming more and more common, and is being adopted by degrees in central Europe also, not because people are convinced that it is an ideal arrangement, but because it is much easier to obtain a higher education for girls in this way, especially in smaller places, where there is already a day high school for boys with sufficient provision for the admittance of girls.

From what we have seen above, scientific research gives us results concerning the general features of the question of health in coeducation, but these results are not sufficient to enable us to apply them practically at once to every detail of the curriculum, when it is a question of coeducational arrangement for every individual school. It should be a subject of care for teachers and medical inspectors to observe the state of health and the psychical development and variations in the schools, after having drawn up the special curriculum with due regard to the above results. The published results of such observations will be very valuable. In every case it may be the more healthful arrangement, when the curricula are heavy, to choose only a certain number of subjects as coeducational lessons and arrange a part of the curriculum in such a manner that the different physical resistance of the two sexes is taken into account as well as their different mental ability; with boys, the period immediately preceding the development of puberty, with girls, the period of that development itself and the years immediately following are those of minor resistance; as to the psychic side, it seems that after the development of puberty girls surpass boys of the same age.

The investigations by Ayres published in *Laggards in our Schools* have an important bearing on our subject. He sums up his results as follows: " There is 13 per cent more retardation among boys than among girls, and 13 per cent more repeaters among boys than among girls, . . . the percentage of girls who complete the common school course is 17 per cent greater than the percentage of boys. These facts mean that our schools as at present constituted are far better fitted to the needs of the girls than they are to those of the boys."

The literature on the subject of hygiene in coeducation is scattered and frequently published in the less familiar languages, like Swedish, Danish, Finnish. Little or no scientific investigation has been made concerning the subject in England or America, where the practice of coeducation is most common. The most important of these references are given below.

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COEFFICIENT. — See GRAPHIC CURVE; STATISTICS.

COGSWELL POLYTECHNIC COLLEGE, SAN FRANCISCO, CAL. — Founded in 1887 to provide a training in mechanical arts and other industries to boys and girls of the state of California. Applicants are admitted on completing the eight grades of a public school of the state, or equivalent work. The first two of the four years' course are devoted in the case of boys to meet the academic requirements of higher technical and engineering schools; the last two years may be given up to a certain amount of specialization. The course for the girls is also general with manual work and drawing directed toward home economics. A diploma is given on graduation. There is a faculty of 12 instructors.

COGSWELL, WILLIAM (1787–1850). — Educator; graduated from Dartmouth College in 1811. He was a teacher in New York City, and for ten years was the general agent of the American Education Society (*q.v.*). From 1841 to 1844 he was professor of education at Dartmouth College. Author of works on religious education. W. S. M.

COIMBRA, UNIVERSITY OF. — The national university of Portugal. The Papal bull for the establishment of a *studium generale* was issued in 1290, and the university was located at Lisbon. Until 1537 the institution moved between Coimbra and Lisbon, but was then finally established at Coimbra, where it has remained ever since. Generally the University of Coimbra was modeled on that of Bologna (*q.v.*). A theological faculty was not established until 1411. The University of Coimbra has always enjoyed royal patronage, the King still being the Protector of the University and sanctioning appointments to chairs. Rashdall points out that Coimbra retains the medieval atmosphere and customs more than any other European university town. At present faculties are maintained in theology, law, medicine, and the sciences. A faculty of arts does not exist at Coimbra, but in 1859, a school was established at Lisbon and reorganized in 1901, to supply the deficiency (*Curso Superior de Lettras*). In 1909 Coimbra had an enrollment of about 1500 students; the Lisbon course was attended by some 110 students.

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COLBURN, DANA POND (1823–1859). — Schoolman; educated in the common schools of Massachusetts and at the Bridgewater Normal School. He taught in the schools of Massachusetts for five years; served as institute instructor for the Massachusetts State Board of Education, and for two years was an instructor in the Bridgewater Normal School. He was principal of the Rhode Island Normal School from 1854 to 1859. Author of *First Steps in Number* (1847), *Arithmetic and its Applications* (1855), *Common School Arithmetic* (1858), and *Intellectual Arithmetic* (1859). W. S. M.

COLBURN, WARREN (1793–1833). — Schoolman and textbook writer; educated in the common schools of Dedham and graduated at Harvard College in 1820. He was for a number of years principal of a private school in Boston. His *First Lessons in Arithmetic*, published in 1821, was for more than half a century one of the most widely used school books in America. He published a *Sequel to the First Lessons* in 1824, and subsequently a series of school readers and a textbook on algebra. He was one of the founders of the American Institute of Instruction (*q.v.*), before which association (1830) he read his famous pedagogical treatise on the teaching of arithmetic. W. S. M.

COLBURN, ZERAH (1804–1840). — A juvenile mathematical prodigy whose father refused him a collegiate education that he might exhibit the lad for monetary considerations in America and Europe. His father died in England, and Zerah was placed first in the Westminster School and later in a lycée in Paris. Upon reaching adolescence he lost his power of mathematical calculation. He became upon his return to America first a teacher of French and later an itinerant Methodist preacher. See the *Memoir* by himself (Springfield, 1833). W. S. M.

COLBY COLLEGE, WATERVILLE, ME. — A coeducational institution, chartered Feb. 27, 1813, as a result of the efforts of Baptist churches in the state of Maine. On June 12, 1815, the trustees were authorized by the legislature of Massachusetts to "locate in any town within the counties of Kennebec and Somerset"; Waterville was selected. The Theological Department, established here July 6, 1818, was followed by the literary department, organized in October, 1819. On June 28, 1820, the state legislature appropriated to the institution the sum of $1000 annually for seven years, stipulating that at least one fourth of the sum should go toward the reduction of the tuition of deserving students. On Feb. 5, 1821, the name was changed to Waterville College. Small success followed the efforts of an agent appointed in 1859 to solicit subscriptions for the endowment fund, until in August, 1864, Mr. Gardner Colby of Boston subscribed $50,000 on condition that $100,000 additional should be secured. Upon the fulfillment of this condition, the trustees, on the suggestion of President Champlin, voted to change the name to Colby University; the legislature made this the official title, Jan. 23, 1867. Including a bequest received after the death of Mr. Colby in 1879, the benefactions of this patron amounted to $200,000. On Jan. 25, 1890, the trustees decided that the name "university" was inappropriate, and the unusual but obviously sensible step was taken of changing the corporate title to its present form, "The President and Trustees of Colby College." Women were admitted in 1871. Colby College is controlled by a Board of Trustees of 30 members, 7 of whom are chosen annually by the Board; 9 trustees are elected annually by the alumni. Each trustee serves 3 years.

The degrees given are A.B. and B.S. After the freshman year, the studies are largely elective. In January, 1908, the curriculum was largely added to by new courses in science, in preparation for engineering, architecture, and medicine. Colby College has the life of the "small college," centering largely in the fraternities, which include practically the entire student body. The fraternities established include: Delta Kappa Epsilon, Zeta Psi, Delta Upsilon, Phi Delta Theta, Alpha Tau Omega, Sigma Kappa. All the chapters occupy houses; a unique experiment was the assignment in 1907 of portions of college dormitories for chapter houses. In this way, for instance, the Delta Upsilon chapter occupies the south division of Chaplin Hall, which has been remodeled and improved for social purposes. According to the President's report of 1908, "the chapter house movement has greatly simplified the work of college education and improved the life of the students in every direction."

Grounds, buildings, and equipment are

valued (1908) at $362,515.51. The total income is about $57,000. The average salary of a professor is $1600. There are (1909) 17 members on the instructing staff, of whom 9 are full professors. The students number 283, of whom 133 are women. Arthur Jeremiah Roberts is president. C. G.

Reference: —

History of Colby College; in the biography of its presidents, 1820–1901: in *National Encyclopedia of American Biography*, Vol. VIII, pp. 404–409.

COLD SPOTS. — In 1884 Blix, Goldscheider, and Donaldson independently discovered that the sensations of cold did not originate at all points of the skin, but were restricted to certain limited areas that they called cold spots. These spots are the locus of the endings of certain differentiated nerve fibers that respond to low temperatures and other stimuli with the peculiar quality *cold*. Temperatures below 34°C and above 45°C stimulate the cold spots. The stimulation by the lower temperatures is recognized for itself. The effect of the higher temperature combines with the excitation of the warm spots to give the sensation hot. Von Frey conjectures that the sense organ of cold is the end bulb of Krause, on the basis of the fact that both the end bulb and sensitivity to both are found in the cornea where warm sensations and pressure sensations are lacking. W. B. P.

COLDS. — The word "colds" is a generic term used loosely for any acute catarrhal inflammation of the mucous membrane of the upper air passages. In many parts of this country, as every teacher knows, the prevalence of colds is a serious handicap to school work, not only by causing many absences, but by making it difficult for children suffering from them to do their school work and also by the disturbance of class exercises by frequent coughing. Although the specific cause of the disorder is obscure, it seems to be caused by germs. It is reported by travelers that in the pure air of high mountains, in mid-ocean, and in the arctic regions colds are practically unknown.

While the disorder seems to be a germ disease, the contributing causes are perhaps many, especially anything which causes depression, extreme fatigue, indigestion, a chill, overheating, too thick clothing, lack of cleanliness, and lack of fresh air. The conditions in the schoolroom that cause colds, apart from possible direct infection, are apparently the dust of the schoolroom, the frequent overheating, and the extreme dryness of the air in many schools. The last-mentioned condition, at least, seems to be a frequent cause of sore throats and the like.

Pupils suffering from colds should be carefully watched, and wherever the services of a medical inspector are available the case should be reported. Frequently what seems to be a cold is a premonitory symptom of measles or some other disease. W. H. B.

See articles on Cleanliness; Diphtheria; Grippe; Medical Inspection.

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Knight, Charles H., M.D., and Bryant, W. Sohier, M.D. *Diseases of the Nose, Throat, and Ear*, revised and enlarged. (Philadelphia, 1909.)

COLET, JOHN. — Refounder of St. Paul's School, London, Dean of St. Paul's (1465–1519). Colet has no real claim to the position, first assigned to him by his eighteenth-century biographer, Knight, of the inauguration of a new era of education and of a new system of schools or schools on a new system. In his reconstruction of St. Paul's School he merely followed, and did not set a fashion.

John Colet was the eldest son of Sir Henry Colet, mercer, Lord Mayor of London in 1486 and again in 1496, and Christian Knyvet, a highly connected lady of Norfolk. The school, if any, and college, in which he received his education, are unknown. The probability is that, being the only one of twenty-two children who survived infancy, he was privately educated at home. Before he was twenty, he was beneficed by his mother's family with Dennington rectory, Suffolk, in 1485, by his father with Thurning, Huntingdon, in 1490, which he resigned in 1494, probably on being appointed, also by his father, to Stepney near London. He was given a canonry at York in the same year, and was also a canon of St. Martin's-le-Grand, Salisbury, and Chichester, before he was ordained deacon, so that it is a little strange to find him in a sermon to Convocation in 1512, when he had added to these a prebend and the Deanery of St. Paul's, denouncing those who care not how many benefices they take "so that they be of grette valure." Young Colet, like others, used his benefices as exhibitions to the University, for the first ascertained fact about his education is that from about 1493 to 1496 he was at Orleans and Paris Universities and visited Italy, and studied theology and law. He was ordained deacon in December, 1497, and priest Mar. 23, 1498, while he was delivering a course of theological lectures, chiefly on St. Paul's Epistles, 1496–1499, at Oxford. Here he met Erasmus, who, being a regular or Augustinian canon, was studying at the college of the order at Oxford, called St. Mary's. He was made Dean of St. Paul's in 1504 or 1505. He began his reconstitution of St. Paul's School by building "a scolehouse of stone" for 153 children at the East End of St Paul's Churchyard, a few yards northward of the old school, placed there about 1111, and finished it in 1510, and then began a master's house adjoining it. He obtained the royal license in mortmain June 6, 1510, and on July 27, he himself as Dean and with the Chapter granted William Lily, of Magdalen College, Oxford, then appointed master of the new school, all the privileges of the master of the old school, including a stall in the choir, and "took him into their bosom." On Mar. 28, 1511, he got the Chapter to join him in conveying the new school and the old school, and the Chancellor of St. Paul's to release all his rights over the old school, to the Mercers' Company, of which Colet was a member, as trustees and governors. He also asked the Pope for a transfer of all the rights and privileges of the old to the new school. He gave his whole patrimony, lands worth £53. 6*s*. 8*d*. a year, as endowment, afterwards increased to £122. 4*s*. 8*d*., of which £5 a year represented the old school endowment. On June 17, 1512, he made statutes for the school, but they are not extant, being superseded by a new edition on June 18, 1518. The steps of this foundation have been particularized because the school has hitherto been represented as an entirely new foundation, with no connection with the old school, which has been represented as in abeyance, whereas Colet was careful to place the new school exactly in the position of the old, except that the Mercers were substituted for the Dean and Chapter and Chancellor of St. Paul's as governors. This entirely destroys the theory that the school itself was a new departure. Nor was it, as has been represented, a new departure to make a lay body of governors. Half a dozen Lord Mayors of London, from Sir Edmund Shaw, goldsmith, in 1487, who founded a grammar school at his native place of Stockport in Cheshire, had already made their companies governors of grammar schools founded by them, and William Abbott, a mercer, had made Colet's own company of mercers governors of his school at Farthinghoe in Northamptonshire in 1443. The curriculum laid down by Colet was not that of an advanced humanist insisting on the classics, but of a reactionary, prescribing not Vergil or Cicero, but authors such as Sedulius and Juvencus, who turned the Bible into Latin verse in the fourth to the sixth centuries, and were studied at York in Alcuin's day. The only innovation was the mention in the Statutes, in a rather casual and subsidiary way, of Greek. There is evidence that Greek had been already taught at Winchester and Eton, and it was not the study of the Greek classics so much as of the Greek Testament and the Fathers which Colet had in view. The only novelty about the refounded school lay in its being the largest Free Grammar School, free from tuition fees for all its 153 day scholars, which had yet been founded, while its masters enjoyed the largest salaries yet paid, 52 marks (£34. 13*s*. 4*d*., as against £16 at St. Anthony's for the High Master), and £17. 6*s*. 8*d*. for the Usher or "Surmaster" (as against £5. 13*s*. 4*d*. at Eton and Winchester). But the masters in these other schools had their board and lodging, and fees from Commoners or Oppidans as well.

For a century and a half after its foundation St. Paul's took a high place among English schools. After a century of decay from 1720 to 1865, it was restored by the Endowed Schools Commissioners, being taken out of the exclusive government of the Mercers and removed to a new site and buildings in Hammersmith in 1876, and is now the largest and most successful of the schools of London.

Colet was a reformer in matters religious, and is said to have been near prosecution for heresy. His will significantly makes no gifts to religious houses or for masses for his soul, though he had added a chantry to the school in 1513 to pray for his own and the King's soul. He died Sept. 16, 1519, and was buried in St. Paul's, but his monument perished in the Fire of London. A. F. L.

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COLGATE UNIVERSITY, HAMILTON, N. Y. — Founded in 1818, by the Baptist Education Society, for the education of ministers. The college and preparatory departments were incorporated in 1846. In 1890 the institution, which has been brought into a flourishing condition under the presidency of Ebenezer Dodge, adopted the name of Colgate University in honor of the Colgate family, which had assisted it materially with money and a library. In 1893 Hamilton Theological Seminary became a part of the university. The grounds of the university cover an area of about two hundred and twenty-five acres, of which about one hundred and twenty-five are included in the campus. The equipment consists of seven buildings, used as lecture rooms, laboratories, library, and dormitories. The admission requirements are equivalent to 14 or 15 units, and may be satisfied by examination at the university or under the regulations of the College Entrance Examination Board. Certificates from approved preparatory schools are accepted in lieu of the examinations. The Bachelor's degrees are offered in two courses — arts and letters and science, in each of which a major and two minors must be presented; graduate courses leading to the Master's degrees or the degree of Bachelor of Divinity are also maintained. In 1909, the university had an enrollment of 330 students, including three who were doing graduate work. The faculty consists of 24 professors, 5 associate, and 1 assistant professor, and 3 assistants. Elmer Burritt Bryan, LL.D., is the president.

COLLECTING INSTINCTS. — There is a disposition on the part of certain of the lower animals, such as crows and ravens, to pick up bright objects which attract their attention and to store such objects away, although they do not make any direct contribution to the animal's personal comfort or welfare. This tendency on the part of animals has been described as a natural instinct for collecting objects. Young children exhibit a very strong tendency to acquire and retain objects of which they can make no particular use. This tendency on the part of children has been described as an instinct, and has been compared with the behavior of the animals above referred to. The tendency of older children to become absorbed in the collecting of certain particular kinds of objects, such as stamps or coins or natural history specimens, has been widely discussed as an outgrowth of the more primitive instincts of animals and younger children. Attention has been drawn to the fact that these tendencies of children can be taken advantage of for educational purposes. It is, however, a misnomer to refer to this collecting tendency as an instinct. The natural impulse to make such collections does undoubtedly exist, and its advantages for educational purposes should not be underestimated, but it is a complicated expression of the whole self-asserting tendency of the individual rather than a specific instinct.

See Adolescence; Instinct.

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COLLECTIVE CONSCIOUSNESS.—There are certain common beliefs and modes of thought which grow up in any community of intelligent beings. These common types of consciousness can be considered for scientific purposes as if they stood apart from any single personality. The community as a whole produces this collective or social consciousness, and is in turn controlled by it.

See Custom; Social Psychology; Tradition.

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COLLECTIVE WILL. — This term, like collective consciousness, refers to a social phenomenon. Tendencies toward certain types of action grow up and are fostered in community life in such a way as to become characteristic of the whole social group.

COLLEGE. — One of the many terms for a society or body of persons associated together for promotion of a common purpose which, originally general and applicable to any such body, has become restricted to a particular kind of body; viz. one for the promotion of secondary or higher education. The word "college" comes from Roman through Canon law. Cicero speaks of the College of Augurs and of high priests (*pontificum*), of the colleges of prætors and of tribunes. Livy mentions the college of merchants in 493 B.C., while Horace, in a famous line in his Satires (I, ii, 1) speaks, partly by a sort of metaphor, partly by a sort of jest, of the colleges of ballet girls. Under the Empire the term became identical in meaning with the medieval guild. The law put restrictions on the functions of these associations, and license was needed for them as it was in medieval times. Pliny tells us (*Paneg.* 54) how he was consulted, as governor of his native town, as to the establishment of a guild of smiths (*de instituendo collegio fabrorum*). When he was governor of Bithynia, he forwarded a petition to the Emperor Trajan for the foundation at Nicomedia of a college of working carpenters to act as a fire brigade, but as it was to consist of 150 members, the petition was refused (Plin. *Epist.* X, 43), because of the disturbances already created by such colleges "which, whatever purpose they pretended, became political agitators." Many of the colleges which appear in the later Roman inscriptions all over the Empire were, like the medieval religious guilds, chiefly burial and benefit clubs. By a strange chance, the guild halls of these colleges came to be called schools (*scholæ*), a name no doubt derived from the educational guilds, such as Plato's Academy, which were endowed colleges. These *scholæ* consisted of an oblong hall with a semicircular apse at the end, round which were placed the seats of the president and officers of the guild, while in front of them was the altar on which offerings to or for the dead were made and the table at which they ate their common meals, while a chapel was often attached, in which general meetings and elections of officers were held. A record of such an election at Reggio is dated "in the chapel of the college of smiths and patch-work makers" (*in collegio fabrorum et centonariorum*, Inscr. Orell. 4133). The general meeting of the College of Actors called itself the *sancta synodus*, and the "holy synod" governed the medieval and still governs the Russo-Greek Church. Many of these guilds were known by the names of their patron god, and Jupiter College and Diana College anticipated and indirectly originated the Jesus Colleges and St. Mary Colleges of Oxford and Cambridge.

Professor Baldwin Brown of Edinburgh, in his *From Schola to Cathedral* (1884), suggested that the earliest type of Christian church with nave and apse was derived from the *scholæ* of the *collegia*, and Rossi's researches in the Roman catacombs confirmed and demonstrated the truth of the suggestion. Probably the medieval practice of dubbing the Jewish synagogues *scole* is derived from a similar analogy, if not from direct practice. As the buildings, so the constitution of the Christian churches is derived from the *collegia*. The bishop and his college of clerks, even in the days of St. Jerome, were, like the members of the *collegia*, in regard to their corporate property, supposed to have all things in common, especially their meals. But the growth of episcopal power converted an oligarchy into an absolute monarchy, a college of equals, having all things in common, into a bishop, as absolute owner, dispensing to his court of clerks what he thought fit (*Decretal* ii, c. 24, cxii, qu. 1). At the end of the fifth century (*ibid.*, c. 26–30) the property of each church was divided into four parts, of which the bishop took one, his clerks a second, the fabric a third, and the fourth was to be given to the poor, and this rule was also laid down by Gregory the Great to Augustine of Canterbury at the foundation of the English church in 601. But the bishop was elected by the clergy, and he could not alienate any church property without their consent. By the eleventh century the clergy of Rome had become recognized as the council and electors of the Pope, and the College of Cardinals and the clerks, now called canons of the Cathedral Churches, had become a council with possessions separate from those of their bishop. The corporate existence was recognized, but under the name of the canons or the chapter (*capitulum*) of canons, not college. The early collegiate churches, which were not actually bishops' sees, though often, as in the case of Ripon in Yorkshire and Crediton in Devonshire, they had been bishops' sees, used the same term of chapter for their corporate title, and grants made to them were made simply to the church and the canons serving it. It was probably owing to the revival of the Roman, or, as it was called, the civil, in distinction from the canon law, that the term "college" reappeared. One of the earliest, if not the earliest, uses of it is in a constitution of the Lateran Council (c. 42, 1,6) of 1215, by which it is ordered that in the selection of a bishop by the chapter, "three of the college" (*de collegio*) are to be appointed to take the votes. The canons of Treves are called a *collegium* in the headnote to a letter of Innocent III about the same date, but as an alternative headnote speaks of the "chapter," it is not certain that the first headnote is contemporary with the letter. In England, in the middle of the thirteenth century, when the mania for monks and monasteries, including the so-called regular canons, and the friars had died down, and a revulsion in favor of the secular clerks, the ordinary clergy, had taken place, largely owing to the growth of the universities, colleges or collegiate churches began to be founded all over the country. During the monastic predominance, the clerks had been turned out of many cathedrals and ancient collegiate churches, mostly of pre-Conquest date, which had been founded on the model of the cathedrals, like Bedford and St. Frideswide's at Oxford, and which consisted, like the cathedrals, of bodies of secular canons, presided over by a dean or provost, with a schoolmaster as their first or second chief officer. From 1250 onwards to the Reformation there was an extension and revival of such of these old collegiate churches as had survived, and a constant erection of new ones. The essential feature of these new creations was the endowment of a body of priests to live together in one community, the older ones in separate houses gathered in a square round the common center, the church, the later ones generally in a common house. . . . Sometimes, as at Howden in Yorkshire in 1266, a rich rectory, worth, say, £60 a year, equivalent to £2400 a year of modern English money, was cut up into half a dozen "prebends," given to as many priests, who were bound to be resident and do the services. More often a parish church, situate in the place, from which some successful prelate had sprung, was taken and made the seat of a college of priests, a number of neighboring parish churches being bought and their revenues appropriated to the college, while the appropriated churches were served, either by the members of the college going out to them to do the services, or, when they were too distant, by perpetual curates or vicars who were given the lesser tithes for their living, while the great tithes and landed property were taken by the members of the college. It is in connection with these new foundations that in England the term "college" is first found.

The earliest instance forthcoming is in the foundation deed, Mar. 26, 1267, of the collegiate church (*collegiatam ecclesiam*) of St. Thomas the Martyr at Glasney, now part of the town of Penryn in Cornwall, by Bishop Bronescomb of Exeter (*Exeter Ep. Reg. Bronescomb*, ed. Hingeston-Randolph, 1889, p. 44). He says he founds it for the spread of divine worship and the increase of the beauty and splendor of the house of God and gives to it the parish church of Penryn which was very poor and the revenues of the church of St. Budock (in which parish the church stood) which had long been divided into portions, being no doubt an ancient collegiate church, and a neighboring parish church of St. Feock for the food and maintenance of the clerks serving there forever. They are to be thirteen in number, the most usual number of such establishments, after "Christ and his apostles twelve," and are especially directed to be called secular canons, and to be governed by the same customs and enjoy the like liberties as those of Exeter Cathedral with thirteen vicars to serve under them in the choir. One of the number was to be "the Proctor of the corporate body" (*procurator collegii*) until a captain or warden could be formally endowed. By a further deed of Sept. 1, 1270, four more parish churches were annexed to the collegiate church, and in 1272 there is a provost as head, and the bishop informs us that the buildings and mansions of the canons had been erected of sumptuous work, and the bare land had been turned into gardens and orchards by them, in return for which the obits, or the anniversaries of the deaths of these first canons, were to be celebrated forever and 8*s.* spent on those canons, vicars, and clerks attending each. His successor, Bishop Peter Quinel, in 1283 annexed the ancient prebendal church of St. Probus and gave its prebends to the Provostry.

In that year, 1283, two similar colleges were founded: one in Wales by the bishop of St. David's, who "considering what health and solidity arises from the unanimous and united company of an established college," made the church of Llangadock collegiate (*collegiatam facimus*) for 21 secular canons and as many vicars; and the other in the county of Durham by Anthony Bek, Bishop of Durham, who made the church of Lanchester collegiate with a dean and seven prebendaries. The same prelate founded the collegiate church of Chester-le-Street in 1286, and refounded and enlarged that of St. Andrew Auckland in 1292. In 1300 the term "collegiate church" is for the first time applied to Southwell Minster, the Archbishop of York's Nottinghamshire quasi-cathedral, which had existed since at least the year 800; and in 1304 the term is used of the same archbishop's East Riding of Yorkshire quasi-cathedral for the canons of St. John of Beverley, founded by King Athelstan about the year 900. Thenceforward the term became the technical term for all such churches. In all of these, as in the cathedrals, a grammar school and a song school, and in the older and larger ones a theology school, were essential and important features. It is a curious thing that though the movement in favor of colleges of secular clerks was no less pronounced at the universities than elsewhere, if it did not originate there, yet none of the earlier university colleges are so called.

The earliest university colleges were at Paris University. The universities originally consisted of casual assemblies of clerks who lived in hired houses in the towns, singly or in groups as they chose. The collegiate foundation gathered them together and provided free lodging and free living. The earliest at Paris, in later days called the College of Eighteen (*Collège de Dix-huit*), was oddly enough founded by an Englishman. Joyce or Joicey (Jocius) of London, returning from a pilgrimage to Jerusalem was much struck with the arrangement by which the Hospital of St. Mary at Paris by an ancient custom founded a chamber for poor clerks to live in. The Chancellor of Notre Dame, who was the chancellor and presiding genius of the university, was proctor or governor of this hospital. With his assistance Joyce bought the room for £52 on condition that the hospital governor should always maintain eighteen beds sufficient for so many scholars-clerks (*scolaribus clericis*) and give them 12*s.* (*nummos*) a month each for maintenance, in return for which the scholars-clerks were to carry the cross and holy water before the bodies of the sick who died in the hospital and sing every night the Seven Penitential Psalms. The deed of Dean Goldenbeard (Barbedaurus) and the chapter of Paris confirming this arrangement was made in 1180 (Denifle, *Chart. Univ. Paris*). The example set by Joyce of London was followed at the Hospital of St. Thomas the Martyr (Becket), also a Londoner, near the Louvre, by Robert, Count of Dreux, in 1186, he providing a separate building in the hospital known as the "House of the Poor Scholars of the Louvre." In 1209 Peter of Nemours, Bishop of Paris, in what was afterwards known as the College of St. Honoré, founded beds for thirteen poor scholars, under the wardenship of a canon of St. Honoré. This too was only called the House of the Poor Scholars of St. Honoré. Similarly, the St. Nicholas Louvre College in 1247, the Oriental College founded by direction of Pope Innocent IV, in 1248, the great College of the Sorbonne, which ultimately swallowed up the University itself, founded by Roberts of Sorbonne, canon of Paris, in 1257, the Treasurers College, founded by a treasurer of Rouen Cathedral in 1266, and the College of Navarre, founded by the Queen of Navarre and France in 1304, were all called, not colleges, but houses of Poor Scholars.

In England the earliest known provision of the same sort was also in about the year 1180, when Simon of Farlington, in Hampshire, Archdeacon of Durham, probably imitating St. Cross Hospital, Winchester, gave the Almoner of Durham Cathedral Monastery a manor which he had bought to maintain three scholars of Durham School sent to dine and sleep in the Almonry Hospital by the Schoolmaster. But this was not for scholars of university standing. The earliest English university college was that of St. Nicholas at Salisbury, founded in 1262 by Giles of Bridport, Bishop of Salisbury, where there was a university since 1209, for 2 chaplains and 20 poor, honest, and teachable scholars in a house by St. Nicholas' Hospital, under the wardenship of a canon of the cathedral. This was called the House of the Valley Scholars of St. Nicholas. So the first College of Oxford University founded in 1264 for 20 scholars living "at Oxford or wherever else a university may chance to flourish," to be maintained by two or three chaplains managing estates and living at Maldon in Surrey and teaching 13 founder's kin grammar there, was named "the house of the scholars of Merton," after Walter Merton, Lord Chancellor of England, its founder. In 1269 Bishop Walter de la Wyle founded a theological college at Salisbury for 13 priests to study theology there under a provost, called St. Edmund's house. In 1270 Merton moved his House of Scholars from Maldon to Oxford, and in 1274 gave them a code of statutes, the model of all future college statutes. But the word "college" does not appear, though it was in all respects like a collegiate church, the Church of St. John the Baptist being appropriated to it, as the Church of St. Edmund was to St. Edmund's College at Salisbury, the warden and scholars sitting in the choir and holding precisely the same position in regard to it as the Dean and canons did in an ordinary collegiate church. At Cambridge the first college was originally founded on Dec. 24, 1280, in almost exact imitation, conscious or unconscious, of Joyce at Paris, by Bishop Balsham of Ely, placing some poor scholars in the Hospital of St. John at Cambridge (now St. John's College). But finding that the regular canons, who managed the Hospital, quarreled with them, on May 28, 1285, he moved the scholars outside the town by St. Peter's Church, which he appropriated to them. The name the founder gave the college was the House of the Scholars of the Bishops of Ely, and they were directed to follow the rule of the House of Scholars of Merton at Oxford. It took its popular name, by which it is still known, of Peter-House from the church which has changed its name for that of St. Mary-the-Less. It is not till friar John Peckham, Archbishop of Canterbury, as visitor, made ordinances for Merton in 1284, in which he speaks of Walter of Merton as "planter and founder of your college" that the word "college" is used for any educational collegiate establishment.

Forty years later, King Edward II, on Apr. 26, 1324, granted license to his almoner, Adam of Brom, to found "a college of scholars studying in divers sciences, in honor of the Virgin" to be governed by a "rector." The king in 1326 approved statutes to be observed "in the college of the scholars of the house of the Blessed Virgin of Oxford," and the founder himself called it "the college of scholars of the House or Hall of the Blessed Mary," the Church of St. Mary, now called the University Church, being appropriated to it. The popular name by which it is still known, Oriel College, came from some feature of the building. The next college, now Exeter College, was called in the royal license to Bishop Stapledon of Exeter, its founder, a collegiate hall (*aulam collegialem*) and named Stapledon Hall. It was the first college to which no church was appropriated, having instead its own chapel within its walls, chiefly because the church of the parish in which it stood, St. Peter's in the East, was already appropriated to Merton. At Cambridge the term "college" was first used in the license to Edmund Gonville in 1348 to establish "a college of twenty scholars and to give a name to it," and he gave it the name of "the house or hall of the annunciation of the Blessed Virgin, in English 'Gonville Hall.'" It was not till a generation later that the term "college" was transferred from the society of scholars to the place they lived in. License was granted to William of Wykeham, Bishop of Winchester and ex-Lord Chancellor, in 1379 to grant certain property he had bought in Oxford to found "a certain college, house, or hall, and give it a name, for a Warden and seventy scholars studying in divers faculties in the University of Oxford." The name given was "in the vulgar tongue, 'Seinte Marie College of Wynchestre in Oxenford,'" but a hurrying people called it, and continue to call it, New College, Oxford. In this college the domestic chapel was for the first time made the largest and most important part of the building, exceeding the dimensions of many parish churches. This foundation deed of New College is the first example of the word "college" in English, a year earlier than that given by the New English dictionary in a quotation from Wycliffe, referring to Christ and his college of apostles. Three years later, William of Wykeham gave legal permanence to the school he had been maintaining, since 1373 certainly and probably since 1369, at Winchester, by incorporating it, too, as a college under the name of "Seinte Marie College of Wynchestre" to consist of a warden and 70 scholars-clerks (*custos et scolares clerici*), the identical term used by Joyce of London at Paris in 1180. Only the scholars in this case were not of mature age studying in the higher faculties, but boys of 7 to 18 years of age learning grammar. This college was placed under the guardianship of the College of Oxford, to which it was to serve as a feeder, and from which it was exclusively recruited. When the present college was finished in 1394, the founder made it more like an ordinary collegiate church by adding 10 priest fellows to say masses for his soul, but though with the warden they formed the governing body of the college, they never became a part of the actual corporate body, which always remained "the warden and scholars-clerks." This was a new departure of great importance in the history of education, especially as with the 70 "poor and indigent" scholars — whose poverty was a very relative term, as it comprised sons of judges and masters in chancery and sheriffs and other country gentlemen — were associated 10 gentlemen's sons (*filii nobilium*) as boarders (*commensales*) with them paying for their board. They came to be known as Commoners. In addition any boys who chose to come — and they came to the number of 80 or 100 — were admitted to the school, though living, like the university scholars, in the city at home or in lodgings, but these last were not recognized as part of the foundation. The foundation deeds of two much smaller foundations of the same time are preserved, one the House of Scholars or Schoolhouse (*Domus scolarium* or *Domus scolarum*) of Wotton-under-Edge in Gloucestershire, founded by Lady Katharine Berkeley (*q.v.*) in 1384, the other the College of Bredgar in Kent, founded by subscription in 1397. Each of these was for a master in grammar, who was to act as chantry priest, and teach a grammar school; and two boys who were to act as pupil teachers under him, and he and they were directed to live college-wise (*collegialiter*) together. It is probable that these foundations had their models abroad, as in a mighty encyclopedia of Canon Law (Brit. Mus. MS. *Reg.*, 6, E, 7) by one James, written about 1350, under the term " Collegium," to the question " Who can form a college? " the answer is, " Say the men of any profession, such as grammar teachers (*grammatici*) or of any occupation, as bakers and the like." It looks therefore as if collegiate schools were already known before Wykeham's foundation. But if known to him, they are not known to us.

Wykeham's example was speedily imitated. Henry Chicheley, an eminent canon lawyer, one of the earliest scholars of Winchester College and of New College, who became Archbishop of Canterbury, founded in 1425 a college at his native place, Higham Ferrers in Northamptonshire, in which he collegiated the parish churches, attached to it the preëxisting almshouse of thirteen poor men and the grammar school, and made the grammar schoolmaster one of the fellows. He did not, however, unfortunately for it, attach this college to his College of All Souls, which he founded at Oxford in 1437, and so it perished. In 1440 King Henry VI followed the example of his godfather, Chicheley, and began to establish, not at his native Windsor, which already possessed the ancient College of St. George's, but at Eton near it, a college school, collegiating the parish Church of St. Mary, establishing a College of St. Mary of Eton by Windsor to consist of a provost and 25 scholars-clerks, studying grammar, an almshouse of 25 old men, and a free grammar school. At the same time he founded St. Nicholas' College at Cambridge for a rector and 12 scholars in the higher faculties. In 1445 under the influence of his secretary Beckington, another of the early scholars of Winchester, and Waynflete, its headmaster, whom he transported to Eton and made Provost there, he refounded his colleges, increasing them to the same number as Wykeham's 70 scholars in each, with 20 " noble " commoners, and any number of oppidans who wished to attend the Free Grammar School. It is curious that he did not take the step forward, as Chicheley had done, of making the master a member of the college. His failure to do so made Eton like Winchester, both the creators of the English public school system, a system of boarding schools for the upper classes at high rates. For the pay of the master, £10 a year, being fixed by statute, necessitated his looking to fees, instead of to a rise in salary, for his reward, when the value of money fell, and made the Free Grammar School of Eton, supposed to be free of tuition fees, the most expensive and aristocratic in the kingdom. The colleges of Alcaster, near York, founded by Bishop Stillington, Lord Chancellor and Bishop of Bath and Wells, *c.* 1464, and of Jesus of Rotherham in Yorkshire, founded by one of the first King's College scholars, Thomas Rotherham, Lord Chancellor and Archbishop of York, in 1480, did take this step. But these colleges consisted of a provost to manage the property and preach, and three fellows, who were respectively to teach free schools of grammar, song, and writing, the last including arithmetic and " all scriveners' craft." In 1487 William of Waynflete, the ex-headmaster of Winchester and ex-provost of Eton, afterwards Lord Chancellor and Bishop of Winchester, founded Magdalen College at Oxford, and attached to it a grammar school, and particularly ordered that the boys should not be taken from grammar and put on to become sophisters, *i.e.* to study philosophy and logic, until they had become thoroughly proficient in their classical authors. He also attached to it a grammar school at his native place of Wainfleet in Lincolnshire but did not make the boys there an integral part of his college. Forty years later, the greatest of all educational college founders arose in Thomas Wolsey, Lord Chancellor and at the same time Archbishop of York and Bishop of Durham and cardinal. " The whirligig of time bringing about its revenges," he reversed the proceedings of the twelfth century and suppressed monasteries wholesale for his two colleges, turning St. Frideswide's Priory into Cardinal College at Oxford, and St. Peter's and other monasteries into Cardinal College at Ipswich, the one for 100 fellows, the other for a warden and 50 boys. But on his fall, these great foundations ceased when they had hardly begun to be. The one, however, refounded by Henry VIII, became Christ Church, Oxford, partly a cathedral, partly a college, which affects *par excellence* the older title of "the House." A small fragment of the Ipswich endowment was bestowed on the grammar school, which had existed long before Wolsey and flourishes still.

Though the educational colleges were some of the most important, they were by no means the most numerous of the colleges founded between 1250 and 1535. Not only were collegiate churches of the ordinary type, in which church services came first and education only incidentally, being founded all over the country through the whole period, but the subordinate bodies of clerics attached to the cathedrals were incorporated in colleges also. The Vicars Choral, or choir deputies of the canons at York and Hereford, at Lincoln and Southwell and elsewhere, were incorporated; the chantry priests, the priests endowed to sing for single people's souls, as at York and Southwell minsters, and even at large parish churches like Hull and Boston, received common endowments and were incorporated as a body;

the choristers also were sometimes constituted a separate college with separate estates. Not less than two hundred of these colleges, besides University and School Colleges, existed in 1545. But with the educational colleges as well as the guilds and brotherhoods, which reproduced the Roman *collegia*, they were all swept into the act for the abolition of all such corporations, commonly called the Chantries Act, of 1545, which empowered Henry VIII to confiscate them all to pay for his wars with France and Scotland. This act was for Henry's life, and he died before he had confiscated more than a dozen colleges. A new Chantries Act was passed in the second year of Edward VI, 1548. From this the colleges of the universities and the three collegiate schools attached to them with the cathedrals were exempted. All the rest were absolutely abolished. Even new colleges, such as Thornton in Lincolnshire, which, when the monasteries had been abolished between 1535 and 1540, had been converted into colleges by Henry VIII himself, though education had been given in them a place almost as important as in the university colleges, were now dissolved. In the new cathedrals, into which some of the old cathedral monasteries and greater abbeys were converted, the schools were made an integral part of the new college, and the name of "college" at Gloucester, Bristol, Worcester and elsewhere superseded that of "abbey" and "priory" and has left its memory in College Streets and College Greens. But with these exceptions, and that of the College of Surgeons, all the colleges, which survived the year 1548, 13 at Oxford, 14 at Cambridge, with Winchester, considered part of Oxford, and Eton, part of Cambridge, were educational. Hence the term "college" came to be regarded as meaning exclusively an educational establishment.

The foundation of colleges did not cease at the Reformation. But thenceforward colleges were, with the single exception of Westminster Collegiate Church, which maintained what for three centuries was the chief school of London, and for a century the chief school in England, solely educational. Edward VI designed great law colleges at Oxford and Cambridge which never came into existence. Private benefactors were more successful. At Oxford Sir Thomas Pope created Trinity College in 1554 in what had been Durham College, the Oxford College for eight student monks from Durham. Sir Thomas White, a successful merchant tailor, founded St. John's College in 1555 in the deserted college of the Cistercians. After several futile attempts, Gloucester College, the college of the southern Benedictine monks at Oxford, which had sunk into an unendowed hall, reappeared as Worcester College in 1714. Wadham College was founded in 1612, a belated imitation of the old colleges, by Nicholas Wadham and his wife; while Broadgates Hall, an ancient house of scholars, blossomed into Pembroke College in 1624, through the efforts of the Municipal Corporation of Abingdon, solicitous to find a place of higher education for the scholars of Abingdon Grammar School.

At Cambridge the Puritan Chancellor of the Exchequer, who had first obtained preferment as chancellor of the court created to deal with the confiscated monasteries and colleges, Sir Walter Mildmay, founded Emmanuel College in 1584; and Sidney Sussex College was founded by Lady Sidney, Countess of Sussex, in 1596. A successful strolling player and actor-manager, Edward Alleyn (*q.v.*), founded a rather pinchbeck imitation of Winchester and Eton colleges at Dulwich, near London, called the "Colledge of God's Guift," in 1619 for a master, warden, and 4 fellows, of whom one was preacher, the second schoolmaster, the third usher of the school, and the fourth organist or Song Schoolmaster, with 12 poor scholars. But as the founder married a young wife before he had fully endowed the college, the foundation lingered in a semi-moribund condition for three centuries, until the growth of London made it blossom into one of the wealthiest of school foundations in the second half of the nineteenth century. Oliver Cromwell, Lord Protector of the Commonwealth of England, founded, out of the revenues of the disestablished Dean and Chapter, a University College at Durham (*q.v.*) by letters patent of May 15, 1657. An ordinance giving it power to grant degrees as a university was drafted in 1659. But the Restoration came before it was passed, and in 1660 the college ceased to be, and the Chapter was restored.

No other college seems to have been founded in England for a period of nearly two centuries from the reign of James I to the year 1800. Then a contingent bequest in default of heirs, made nearly a century before, of the man from whom Downing Street takes its name, was made effective by the Court of Chancery in the creation of Downing College, at Cambridge. It was nearly half a century more before a new crop of colleges began to arise, not as university colleges, but school colleges. These purported to be after the fashion of Winchester and Eton, but for the most part bore no resemblance to them except in name and the fact that they were secondary schools catering for the richer classes. The first of them was Cheltenham College, which had none of the characteristics of a college. It was not in any sense a corporation; it had no corporate property and its members were not coöptative. It was merely a private adventure school run by a number of the old Anglo-Indian civil servants and military men who flocked to Cheltenham for its waters and its cheapness. They combined in 1840 to hire land and buildings and a headmaster. This school catered at first entirely, as it still does largely, for day boys. But it was run on "public school lines" and was successful. In 1894, by being incorporated by Act of

Parliament, it became an endowed school with an incorporated governing body, and so, to that extent, a college in the proper sense. Marlborough College, started in 1843, was of the same kind, except that the people who subscribed to it were drawn from all over England and consisted chiefly of clergy and clerically-minded laymen, largely lawyers, instead of military men. It aimed at being a cheap Rugby, a boarding school for a lower middle class. St. Peter's College, Radley, in Berkshire, some five miles from Oxford, was a real school college, founded with a deed and a code of statutes by William Sewell, a Wykehamist himself, on the model of Wykeham's foundation, as modified by Rotherham, the warden being the headmaster and the assistant masters the fellows, who lived and acted together as a body corporate, though permanent endowment and legal incorporation did not come till 1861. St. Andrew's College, Bradfield, founded by the rector and owner of Bradfield, near Reading, was founded in 1850 on a similar model, with the founder as warden and the masters his appointees; but it did not obtain a royal charter and incorporation till 1862. Wellington College, also in Berkshire, founded by subscription in honor of the Duke of Wellington in 1859, like Clifton College in 1860, Malvern College in 1862, and Haileyburg College in 1864, all ranking among the "Great Public Schools" of England, followed in quick succession. Since then so-called colleges, which are merely schools and often merely private schools, such as Brighton and Eastbourne colleges, have been and are being founded in every year that passes. In 1870 Keble, and in 1874 Hertford Colleges were founded at Oxford, and in 1882 Selwyn College at Cambridge, but this is not recognized as a college of the university.

At the same time so-called colleges, not of the school but of the university type, have been founded all over the country, beginning with University College and King's College, London, in 1828; Owens College at Manchester, now the University of Manchester, in 1851; Mason's College in Birmingham in 1870, now a college of Birmingham University, founded in 1900, and many more. The term has been extended and made common in the so-called Training College for Elementary School Teachers, built by government aid broadcast. Now any private individual sets up a private adventure school, here to-day and gone to-morrow, and any town or county council sets up a technical school, paid for out of the rates, and dubs it a college, so that the term threatens to become a pretentious name for a secondary school, with a secondary connotation of a place of "university" or technical education for those over 16 years of age. A. F. L.

COLLEGE, THE AMERICAN. — **General Introduction.** — The origin of the American college as the one distinctively American educational type and the complex problems that confront that institution to-day cannot be understood apart from their historical setting. With the Renaissance in Europe in the eleventh century came the university, with its four departments, the arts course and the professional schools of law, medicine, and theology. The arts course, of which the American college is the lineal descendant, was everywhere regarded as preparatory to professional studies. Its purpose was to lay a broad and general foundation for the specialized studies of the higher faculties. Not long after the close of the Middle Ages, a modification of the arts course began which has continued to the present day. The elementary studies were gradually crowded down into the programs of preparatory institutions, and more advanced studies took their places. The trivium, — grammar, rhetoric, and dialectic, — which at first led to the A.B. degree, was little by little relegated to a new type of school which developed to prepare students for the arts course. But even after the Renaissance and the Reformation had thus affected the trivium, the arts course retained its distinct relationship to the professional schools. The Renaissance, with the ideal of culture for its own sake, left a lasting humanistic impression on the old arts course. The wider vision of the new learning regarded the college course no longer as a mere preparation for the study of three traditional professions, but rather as a liberal training leading directly to effective participation in scores of new activities.

With the Reformation in Germany came changes which led to a new type of university and eventually to a school system with no intermediate institution parallel to the early arts course. In time the college with its dormitory system and secluded life disappeared, and in the commercial towns of Germany the modern type of university developed. At the same time several new types of preparatory schools were founded which gradually developed into the modern gymnasiums with courses leading directly to the universities. This was not, however, without periods of transition characteristic of the origins of schools in all countries. The new type of preparatory school edged its way in between the old grammar school and the arts course, overlapping in both directions. After a long period, during which the fields of the several types of institutions were but vaguely defined, a line was drawn in the nineteenth century between the gymnasium and the university, leaving to the former virtually the entire arts course of the early universities. Thus the German university abandoned the old ideal of liberal education and general mental discipline in favor of specialized technical training. The Reformation in England had no such effect on English higher schools.

The colleges of the English universities, with their separate buildings, organizations, and community life, were so firmly established, so fortified by tradition, so safe from the encroachments of state secondary schools, that they have survived, with insignificant changes, even the insistent demands of modern times. Instead of the somewhat antagonistic gymnasium, there arose in England the great public schools — such as Winchester, Eton, Rugby — dominated by the universities and in full sympathy with them. Thus the English college has retained as its aim the training of the faculties for use in all the needs of life, — its ideal a liberal rather than a technical education.

It was this arts course and this ideal that the early settlers sought to transplant in America, and here almost at once began the Old World custom of crowding down the elementary subjects into the programs of the lower schools. From the founding of Harvard College in 1636 to the present day, this process has continued. Toward the end of the eighteenth century, this process helped to establish the academy, in some respects an intermediate school between the colleges and the old Latin grammar schools. The history of the academy suggests the German gymnasium. It took over more and more of the work of the early college; and the college responded, at first rather reluctantly, to the constant pressure to add new subjects to its curriculum. When the prescribed course was found to give the student a little of everything and not much of anything, the overloaded curriculum broke down of its own weight. Then the elective system evolved as a means of relief and helped to continue the process that had been going on for centuries. Inevitably the average age of graduation from college was increased by several years, demands came for a shortening of the college course, and the whole question of the place of the College of Liberal Arts in American life became one of increasing importance. (See articles on College Course, Length of; Graduation, Age of.)

Meantime the most significant influence on the college from below has been the growth of the public high school. Under independent municipal management and enthusiastic public support; responding more and more to the demands for practical education; of recent years conscious of its power and throwing off the shackles of college control; reaching farther and farther into the domain once held by the college alone; the public high school has produced in America a situation similar to the one which in Germany long ago resulted in the elimination of the arts course as a separate institution. From above have come two movements, first, the establishment of many professional schools with high school graduation as the standard for admission; and, second, the development of graduate schools of arts under the influence of German universities. The old English arts course and the new German arts course, with conflicting ideals, have produced some confusion wherever they have found their way into the same institution. Few administrators have seen clearly the distinct sphere and function of each type of arts course. The result has been what is called the invasion of the liberal arts course by professional studies. Inevitably the college within the university has suffered by this confusion with graduate schools. It has failed to keep its distinct sphere, to retain a faculty of ablest men devoted primarily to its needs, or to develop a pedagogy of its own, made imperative by changing conditions of size of classes, curriculum, and social needs. All of these historical movements, except the development in America of the graduate arts course under German influence, have affected alike the college within the university, whether under state or private control, and the isolated small college. Out of it all the great problem of the college has come insistently to the front. The early years of the twentieth century mark a period of trial and transition for the college, the outcome of which is not yet evident.

Definition of the College. — The nearest approach to a generally accepted definition of what should constitute a college is that framed by the Carnegie Foundation for the Advancement of Teaching (*q.v.*): "An institution to be ranked as a college must have at least six professors giving their entire time to college and university work, a course of four full years in liberal arts and sciences, and should require for admission, not less than the usual four years of academic or high school preparation, or its equivalent, in addition to the preacademic or grammar school studies." In this definition four years of preparation for college are supposed to cover fourteen units, a unit being a course of five periods weekly throughout an academic year of the preparatory school.

As a matter of fact, however, the terms "college" and "university" usually indicate something inferior to the standard set by the Carnegie Foundation. Although nearly a thousand institutions in the United States and Canada call themselves colleges or universities, not one fourth of these are standard institutions, according to the definition given above. So long as there is no general agreement concerning the lines of demarcation between high school and college and between college and university, there are found numerous "universities" that are inferior in all essentials to the better city high schools. Nor, unfortunately, can it be determined whether an institution meets the standard by an examination of its publications, for there is frequently a grievous discrepancy between the promise of the catalogue and the performance of the "college." Until the standardizing influences recently begun have had further time for uplifting and elimination among institutions aspiring to rank as colleges, the most trustworthy lists are those approved by the General Education Board (*q.v.*) and the Carnegie Foundation for the Advancement of Teaching.

Historical Development. — (Detailed accounts of the development of the more important colleges are given under each separate title, *e.g.* Harvard, Yale, etc.) Among the 21,000 persons who came to New England from 1620 to 1640, — the date of the assembling of the Long Parliament, — were about 100 graduates of Cambridge and Oxford. This proportion of one graduate to about 200 of population was as large as prevailed in any country in the seventeenth century. These men brought with them such college standards and methods as they had known. Harvard College (*q.v.*), founded in 1636, which for more than fifty years remained the only college in America, was largely the product of Emmanuel College, Cambridge. Emmanuel was a Puritan foundation, made by Sir Walter Mildmay in 1584. It is told that Sir Walter, who was the chancellor of the exchequer of Queen Elizabeth, was asked by the great Queen regarding his laying of the Puritan foundation. He is said to have replied: "Far be it from me to countenance anything contrary to your established laws, but (aside he added) I have set an acorn which, when it becomes an oak, God alone knows what will be the fruit thereof." From the acorn thus planted sprang the first college of America, and so, in a degree, many other colleges in the following generations.

John Cotton, Thomas Shepard, and Thomas Hooker, builders of the early Massachusetts Commonwealth, were graduates of Cambridge and of Emmanuel. From Magdalene, Cambridge, came the first president of Harvard College, Henry Dunster (*q.v.*); from Trinity, Charles Chauncy (*q.v.*), the second president; from Peterhouse came John Norton, the interpreter of the doctrine and discipline of the Church; from Trinity also came the leader of the Bay colony, John Winthrop; from Jesus came the apostle to the Indians, John Eliot (*q.v.*); from Emmanuel came, above all others, John Harvard (*q.v.*), who, through his books and a gift of half of his estate, though small, became the founder in a peculiar sense of the college in the new Cambridge. It may be added that the larger number of college-bred men of the New England colonies were found in Massachusetts Bay. Of the 100 souls who came over in the *Mayflower* not one had received a college degree. Elder Brewster was the only liberally educated man in the company, but his education had not covered the full university period. The relation between the old Cambridge and the higher education in America, therefore, is a relation definite, vital, and for many years dominant.

Although seventeen years before Harvard College was established endeavors had been made to found a college in Virginia, it was not until 1693 that a permanent charter was obtained. Even then it was not obtained without opposition. When Dr. James Blair, a Scottish Episcopal clergyman, the founder of the college, went to Attorney-General Seymour with the royal command to prepare a charter, he was met by remonstrances against the expensive liberality, Seymour declaring he saw no occasion for a college in Virginia. Dr. Blair replied that ministers of the church were needed there, as the people of Virginia had souls as well as those of England, and that a college was necessary to educate them. "Souls!" exclaimed Seymour in reply, "damn their souls! Let them make tobacco." But the charter was soon granted, and the college entered upon a career of prosperity which, with certain lapses, it enjoyed down to the Revolutionary War.

The foundation of Yale College (*q.v.*) in the first year of the eighteenth century was likewise the result of a long-continued endeavor. As early as 1648, ten years after the beginning of the New Haven colony, steps, which proved to be ineffective, were taken for the starting of a college. More than fifty years elapsed before the actual foundation was made. In the first year of the eighteenth century a few ministers of the colony petitioned the authorities for a charter, and also engaged to give their own books for its endowment. The charter as granted indicated a desire to uphold and propagate the Christian Protestant religion by a succession of learned and orthodox men. It also expressed the wish that the youth might be instructed in the arts and sciences, and might, through the blessing of Almighty God, be fitted for employment both in Church and State.

Almost fifty years passed after the foundation of Yale before the establishment of another college. In 1746 Princeton, in 1754 Columbia, in 1757 the University of Pennsylvania, in 1764 Brown University, in 1766 Rutgers, in 1770 Dartmouth, represent the noble succession. (See articles on each institution.)

These six colleges, together with Harvard, William and Mary, and Yale, were largely the product of the Church. Harvard College was founded chiefly for the purpose of maintaining a creed and for the education of ministers. Of its 76 graduates between 1642 and 1656 at least 59 became ministers. Indeed, of all the graduates down to 1700 more than half were clergymen. A similar proportion prevailed at Yale for its first half century. (See College Graduates, Professional Distribution of.) The chief aim of the founders and early friends of Princeton was to furnish the Church, and especially their own branch of it, the Presbyterian, with able ministers. Their secondary purpose was to provide a liberal education for all classes. Columbia had for its first governors ministers of the Church of England and also of the Presbyterian, Lutheran, Dutch Reformed, and the

French Protestant churches; and its first class of eight students was taught in the vestry room of the schoolhouse attached to Trinity Church. In the organization of Brown University the Baptist Church, and in the organization of Rutgers College the Dutch Reformed, exercised a controlling influence. In the charter of Rutgers it is affirmed that it was founded for the education of youth in the learned languages, liberal arts and sciences, and especially in divinity, preparing them for the ministry and other good offices. The planting of Dartmouth was the result of the great religious awakening of the first half of the eighteenth century.

In the establishment, therefore, of the nine colleges planted before the outbreak of the Revolutionary War, English conditions prevailed. The motives, too, were religious or ecclesiastical. In most cases the motives were sectarian, but with the narrower motive was mingled a large human purpose. Religion was used as a method for the betterment of men and " for the glory of God," as well as to promote denominational enlargement.

The Declaration of the 4th of July, 1776, contained intimations of our intellectual and academic freedom from Great Britain. So fundamental and vital was the separation that the suggestion was made to establish a new language in the place of the English. Acts which made the colonies independent in political and civil affairs also served to make them independent in affairs educational. In this condition the United States turned for aid and comfort to the traditional enemy of England — France. French officers, commanding French armies and French fleets, coöperated with the American forces. Frenchmen, gentlemen of scholarship and culture, visited the country for scientific, literary, or political purposes. The American Academy of Arts and Sciences (*q.v.*), incorporated in Massachusetts in 1780, proposed to give itself " the air of France, rather than of England, and to follow the Royal Academy rather than the Royal Society." President John Adams said that it was the talks which he had with scholars in Paris that gave him the idea of the formation of the Academy.

The French influence exerted upon the general educational condition is indicated in various ways. In 1784 the corporation of Harvard College received an offer from the King of France to furnish a botanic garden, which the college desired to establish, with every species of seeds and plants which might be required from his royal garden at his own expense. At the same time, too, an attempt was made to found a French Academy of Arts and Sciences in America, with headquarters in Richmond. Its projector, Quesnay, was the grandson of the famous French philosopher and economist, Quesnay, who was Court Physician to Louis the Fifteenth. He came to this country to aid in the Revolution, serving as a captain in Virginia. After giving up military life because of ill health, he traveled through the country, and in these travels conceived the idea of introducing French arts and culture, believing, also, that he could multiply the relations uniting France and this country. The institution was to be national, having branches at Baltimore, Philadelphia, and New York, and also international, being affiliated with similar institutions in Europe. It was designed to give what we might now call graduate instruction. Its curriculum was sufficiently broad, including foreign languages, mathematics, architecture (civil and military), painting, sculpture, engraving, experimental physics, astronomy, geography, chemistry, mineralogy, botany, anatomy (human and veterinary), and natural history. This endeavor interested many people both in America and France. No less than sixty thousand francs were raised toward the endowment. Among the subscribers to the fund were about a hundred of the representatives of the best culture of Virginia. On July 1, 1786, the corner stone of the building was laid at Richmond, and one professor was appointed. He was Doctor Jean Rouelle. But in 1786 France was in no condition to enter into schemes of education or other propagandism outside of her own territory, and the formal endeavor presently came to an end.

On the tombstone of Thomas Jefferson, at Monticello, are three inscriptions indicating that he was the author of the Declaration of Independence, of the fundamental law of Virginia guaranteeing religious freedom, and that he was also the founder of the University of Virginia. In his endeavor for the higher education, a work which Mr. Jefferson regarded as of signal importance, he was largely influenced by the methods, ideas, and purposes of France. While he was minister at Paris he made investigations of the French system of education. The University of Virginia, established in 1825, embodied the French model. He regarded Edinburgh and Geneva as the best foreign universities. At one time it was suggested, by reason of political dissatisfaction, that the leading professors of the University of Geneva should as a body transfer themselves to Virginia. The project, of course, like that of Quesnay, was not feasible, but in the final organization of the university near Monticello the French method of separate schools prevailed. Religious freedom, which characterized and still characterizes the university, represents the French rather than the English tradition. Another manifestation of French influence on the higher education of America is seen in the organization of education in the Territory of Michigan. It is specially represented in an endeavor to found what was for a time known by the dreadful name " Catholepistemiad." The project included the establishment of thirteen professorships, also known by outlandish terms. No religious condition was to obtain in the election of members to the board of trustees. This scheme, too, begun in 1817, like the scheme of Quesnay, came to an end in the form in which it was projected; but it was the germ whence sprang, twenty years later, the University of Michigan.

While the discussions between Jefferson and his friends were going on in relation to the establishment of a university in Virginia, the influence of German scholarship and teaching was beginning to be felt. For a hundred years this influence has been enlarging and deepening. Although Benjamin Franklin was a visitor at Göttingen in 1776, and although at the same university, in 1799, a Pennsylvanian, Benjamin Smith Barton, took his degree of Doctor of Philosophy, it was not until the first decades of the nineteenth century that the influence of the Germans upon American education became evident. In the second decade of the century begins the long list of Americans, who have been students at the German universities for a longer or shorter time. Among the pioneers are Edward Everett, George Ticknor, George Bancroft, Henry W. Longfellow, and J. Lothrop Motley. Motley was a student at Göttingen in 1833. Following him at Göttingen in the next score of years were J. E. Cabot, the biographer of Emerson; Theodore Dwight Woolsey, president of Yale; Benjamin Apthorp Gould, the astronomer; George M. Lane, the Latinist; Francis J. Child, the English scholar; Henry Boynton Smith, the theologian; Horatio B. Hackett, John L. Lincoln, and Roswell D. Hitchcock. The larger number of Americans who went to Germany as students in the first half of the nineteenth century went to Göttingen. The reason for the choice is not evident, but, aside from the attractiveness of the university itself, it is probable that Göttingen, being situated in Hanover, and Hanover belonging to the English Crown, represented a less foreign country than did Prussia or Saxony. Previous to the year 1850 in the universities of Göttingen, of Berlin, and of Leipzig, about 150 Americans were enrolled.

These periods, which may in a general way be interpreted in their prevailing influence as English, French, German, are also, in respect to interior conditions, to be interpreted as ecclesiastical, private, and public. As the colleges founded in the early period were English, and as these English colleges were quite entirely under the control of the Church, the ecclesiastical influence predominated. Following this period, a period which may be interpreted as private or personal became dominant. Colleges were founded by individuals as individuals, not as members of a church. Such colleges are Williams, Bowdoin, and Amherst. This second period was succeeded by a period which may be called public or national, in which the college or university was established as the crown of the public educational system of the state. The state university embodies the essence of this period and movement. (See UNIVERSITY, STATE.) It is not to be understood that these periods are in point of time distinct. The ecclesiastical period projects itself down to the present day, and of course the private or personal still obtains.

In the first years following the close of the Revolutionary War, while the churches were engaged in the administration of colleges already founded, or in the establishment of new colleges, no small share of the body of people came to realize that their needs were not fully met by institutions already existing. Too many of these colleges were the colleges of a sect or a faction. They were not colleges for and of the whole body of people. As this feeling deepened and broadened, it became apparent that the need could be met in one or both of two ways. One method was the method of supervision of and coöperation with existing institutions. Through such a relationship it was thought that these institutions might become more closely adjusted to the needs of the Commonwealth. The second method of the people ministering to themselves through the higher education was the establishment of new institutions to be administered directly by the people.

In various forms the adjustment of the old institutions to modern society was attempted, but the results of the attempts were vain. The Dartmouth College Case (*q.v.*) illustrates such an attempt. It was only after the lapse of half a century and more that the adjustment of the ecclesiastical or private institutions to modern needs was accomplished. Therefore, throughout the nineteenth century endeavors, many and earnest, were made to found new institutions under the full and direct control of the Commonwealth. Out of this desire to promote a most vital type of the higher education sprang such grants of land as followed the passing of the great Ordinance of 1787 (*q.v.*) and the issuing of the Symmes patent in 1794. In the first half of the last century grants were made for the establishment of institutions of the higher education in 22 states and territories; and through 32 acts of Congress, passed largely in the same period, somewhat over a million acres were granted for the endowment of universities. By means of what is known as the Morrill Act (*q.v.*) of 1862 and acts amendatory of it about 10,000,000 acres have been granted to no less than 45 states in aid of the higher education. This vast amount of public domain, though allotted primarily for the endowment of agricultural and mechanical colleges, has frequently become a part of the endowment of the university of each of the states concerned. The value of these vast donations it is now impossible to estimate, but it is probable that the states have realized from them no less than $250,000,000. (See NATIONAL GOVERNMENT AND EDUCATION.)

The two and a half centuries and more of the higher education in America represent, furthermore, a general enlargement of purpose, method, and constitution. The first colleges were founded in no small degree as schools of theology. The clerical purpose was succeeded by the purpose of training men for the great business of living. The later colleges, as well as the older, have ceased to be professional schools; but not a few of them have called into being, as distinct educational agencies, schools for training men for the great professions. Although some schools of theology still continue to exist on distinct foundations — as Andover and Newton — yet schools of medicine and of law are usually integral parts of the university system, and many schools of theology are integral parts of a university, such as the Methodist school in Boston and the Congregational school in New Haven. The first schools of law and the first schools of medicine — as the medical school in Philadelphia, founded in 1765 and the law school at Litchfield, founded in 1784 — were independent schools. The first law school connected with a university and authorized to confer degrees was established in Harvard in 1817. (See LAW, EDUCATION FOR THE; MEDICAL EDUCATION; MINISTRY, EDUCATION FOR THE CHRISTIAN.)

In the enlargement of the function of the university has been founded the school of graduate studies. Its purpose is to promote the cause of research, to enrich the scholarship of the student, and to serve as a training school for teachers in higher institutions. Thirty years ago this agency was beginning its great career of usefulness in and through the university. Its students numbered about 200. In a generation it has so increased as to represent a student body of more than 5000, and has so enlarged its facilities as to become one of the most significant forces of the higher education. (See RESEARCH, ENDOWMENT OF; UNIVERSITIES, AMERICAN.)

Schools, too, in a greater or less degree of a practical nature, have been included in the university. Most conspicuous of these schools are the technical or scientific. Although a large number of such schools still rest on an independent foundation, yet the great universities, as Harvard, Yale, Columbia, Cornell, and Princeton, embrace schools of science as part of their organization. Agricultural, commercial, pharmaceutical, pedagogical, and library schools are also included. The growth of such technical, professional, or semiprofessional schools in the last twenty-five years of the last century, in respect both to number of students, equipment, and public influence, has been great. (See TECHNICAL EDUCATION.)

Thus in the two and a half centuries since the foundation of Harvard, the higher education, beginning with the college designed as a training school for ministers, has been enlarged to include all of the sciences and not a few of the arts. The university has become a great human agency for the promotion of scholarship, for the enriching of manhood, and for professional equipment.

In the development of the American university the life of the undergraduates has become highly organized. Whether students live together in dormitories — a method prevailing more in the institutions of the East than of the West — or in private lodgings, their life is subject to many and diverse relations. Fraternities, strictly so called, clubs, and societies of all sorts are formed. In such universities as Yale and Harvard more than seventy-five undergraduate organizations are found. They exist for purposes most diverse and with constituencies large or small, compact or loose, homogeneous or heterogeneous. Clubs political, musical, literary, social, dramatic, debating, religious, æsthetic, athletic of all kinds are the more common. (See FRATERNITIES; STUDENT EMPLOYMENT; STUDENT LIFE, etc.)

The athletic organization of undergraduate life has become the most significant of all forms. The beginnings of such organization appeared about sixty years ago. As early as 1840 football was played at Yale, but it was, as then played, largely a scrimmage between the sophomore class and the freshman. For the next thirty years the game was played with much irregularity, both in time and method. It was not until the year 1873 that an intercollegiate league was formed. The members of the class of 1844 at Yale and of 1846 at Harvard formed the first boat clubs in those colleges; and in 1852 Yale challenged Harvard to a race, which was rowed on Lake Winnepesaukee on Aug. 3, in which the challenging college was defeated. Baseball was introduced at Yale in 1859, and at Harvard three years later. Harvard played her first intercollegiate game with Brown in 1863, and Yale her first intercollegiate game with Wesleyan in 1865, and the first Harvard-Yale game dates from 1868. From these simple origins the three college sports have so progressed that they now occupy no small part of the emotional interest of undergraduates and absorb their more superficial enthusiasms. These games represent, too, the point where the public, through the newspaper, most readily touches undergraduate life and affairs. (See ATHLETICS, EDUCATIONAL.)

There are other distinct concrete features of the American university which should be included in this sketch. Among them are the alumni associations, the system of fraternities, and the university clubs. These, with other topics related to the college, are discussed under the appropriate heads, or under the title UNIVERSITY AND COLLEGE.

C. F. T.

COLLEGE CURRICULUM. — From the founding of Harvard College in 1636 to the Revolutionary War the college curriculum in America was for the most part a faithful following of the studies that had been pursued in English universities by the promoters of higher education in the New World. As late as 1764 the influence of the mother country is shown in the Charter of Brown University, which empowers the institution to "Confer any and all the Learned Degrees which can or ought to be given and conferred in any of the Colleges and Universities in America, Europe, and particularly in the University of Cambridge, and Edinburgh in Great Britain." The avowed object of all of these colleges, on both sides of the Atlantic, was to raise up a body of learned men, especially men for the Christian ministry.

The laws of President Dunster of Harvard, adopted in 1642, and now preserved in the archives of the university in the President's own handwriting, indicate the scope of the first college curriculum in America. The document opens as follows: "Every scholar that on proof is found able to translate the original of the Old and New Testament into the Latin tongue, and to resolve them logically, and shall be imbued with the beginnings of natural and moral philosophy, withal being of honest life and conversation, and at any public act hath the approbation of the Overseers and Master of the College, may be invested with his first degree; but no one will expect this degree unless he shall have passed four years in college and has maintained therein a blameless life and has sedulously observed all public exercises." In advocating the change from the three-year course, with which the college started, to a four-year course, President Dunster is at pains to point out that "the scholars will not thus remain in our college one minute longer before they become M.A. than ordinarily they do in all the Cambridge colleges in England." The requirements for the degree of Baccalaureate in Arts at this time read: "The first year shall teach Rhetoric, second and third years Dialectics, and the fourth year shall add Philosophy. . . . In this course of four years each one shall dispute twice in the public schools and shall respond twice in his own class; which if he performs, and is found worthy after the regular examination, he shall become an A.B." This was the curriculum of Oxford and Cambridge, which all but one of the American colleges sedulously followed during the period of colonial dependence, and the influence of which survives to-day in our oldest institutions. The curriculum was itself a heritage of the ancient Trivium (*q.v.*) (grammar, rhetoric, and dialectic) and Quadrivium (*q.v.*) (arithmetic, geometry, music, and astronomy). Influenced by the Church, however, the curriculum of Cambridge, England, in the early years of the college at Cambridge, Mass., had become little more than Latin and Greek, with much drill and disputation in Aristotelian logic and philosophy, to which was added some elementary mathematics and a few scraps of physical science.

The first college curriculum in America, as published in *New England's First Fruits*, reveals a three-year course, as follows: —

(1) Mondays and Tuesdays: Philosophy, comprising logic and physics for the first year, ethics and politics for the second year, arithmetic, geometry, and astronomy for the third year. For each morning, theory; for each afternoon, practice in philosophical disputations. (2) Wednesdays: Greek for all classes. For the first year, etymology and syntax, with afternoon practice in the rules of grammar; for the second year, prosody and dialectics, with practice in poesy after dinner; for the third year, more Greek in theory and practice. (3) Thursdays: theory of Hebrew, Chaldee, and Syriac grammar with practice in corresponding Biblical texts. (4) Fridays: rhetoric, with English composition and declamation. (5) Saturdays: mornings, "Divinity Catechetical" and "Common Places," *i.e.* scholastic disputations; afternoons, history in the winter, nature of plants in the summer. This curriculum of President Dunster remained substantially unchanged during the entire seventeenth century.

Yale owed its early curriculum to Harvard, and, in turn, passed it on to Princeton. For nearly a century after the founding of Harvard, there was no important change in the studies. Then Yale received some valuable "philosophical apparatus": surveying instruments, a telescope, a microscope, a barometer. This was the humble beginning of the scientific studies, which, just a century later, were to demand a curriculum of their own, parallel to the classical course leading to the B.S. degree.

During the middle of the eighteenth century, some provision is found for the study of chemistry, astronomy, geography, algebra, trigonometry, conic sections, and fluxions. Benjamin Franklin's gift of electrical apparatus is received at Yale, and James Bowdoin's "generous donation of an Orrery" at Harvard. French is now and then permitted as an extra course. But divinity supported by Hebrew remains the crowning study of the curriculum; and the General Assembly of Connecticut, in 1753, declares anew "that one principal end proposed in erecting the college was to supply the churches in this Colony with a learned, pious and orthodox Ministry." Up to this time the New World seems content with the meager curriculum of the Old World. The new ideals and the new studies were to come with the breakdown of traditions in the Revolutionary period, the consciousness of national life, and the need of training for citizenship.

The announcement of King's College (now Columbia University) in 1754 heralded a broader course of study. Children are to be taught not only goodness, but " such useful knowledge as may render them creditable to their Families and Friends, Ornaments to their Country and useful to the public Weal in their Generations. . . . As to Religion, there is no intention to impose on the Schollars, the peculiar Tenets of any particular Sect." About this time William Smith drew up his *General Idea of the College of Mirania*, the first independent effort in America to construct a logical curriculum, and the first clear statement of the modern aim of good and efficient citizenship. The author of this enlightened plan was elected First Provost of the " Academy " in Philadelphia. There, in 1756, he secured the adoption of a liberal scheme of studies. It included not only the classics and elementary mathematics, but surveying, navigation, dialing, and Euclid. In the third year came ethics and physics, the laws of nations, government, trade, and commerce. Physics included mechanics, and experimental philosophy, astronomy, natural history, chemistry, and agriculture. For private hours readings were recommended in a wide range of subjects. Throughout the three years of the course the professional needs of theologians, of first importance in the contemporary curricula of Harvard, Yale, and Princeton, were at Philadelphia subordinated to the practical needs of all students. Provost Smith himself says that this early curriculum of the institution that was to become the University of Pennsylvania, the first modern college curriculum in America, was faithfully carried out, and with great success.

William and Mary College, from its foundation in 1693 to the Revolution, had virtually the Oxford curriculum. In 1779 came radical changes. In that year Thomas Jefferson became Governor of Virginia and one of the Visitors of the college. He says, " I effected during my residence in Williamsburg that year a change in the organization of that institution, abolishing the grammar school and the two Professorships of Divinity and Oriental Languages, and substituting a Professorship of Law and Police, one of Anatomy, Medicine and Chemistry, and one of Modern Languages: and the Charter confining us to six professorships, we added the Law of Nature and of Nations and the Fine Arts to the duties of the Moral Professor, and Natural History to the Professor of Mathematics and Natural Philosophy." President Madison said, in 1780, " The Doors of ye University are open to all, nor is even a knowledge in ye ant. Languages a previous Requisite for Entrance." This liberal program of William and Mary, freed from the control of any particular sect, instituted by statesmen, dominated by the democratic ideals of the American Revolution, marks the close of the Colonial Period in the history of the college curriculum in America.

It must not be supposed, however, that there was any sudden and general expansion of college programs. Academic groups are too conservative to admit anything but the most gradual evolution. Even after the new light was brought from without to shine on the old college of William and Mary, the program at Yale for the first three years of the course, as indicated by President Stiles's *Memoranda* of Nov. 29, 1783, was still mainly Latin, Greek, and mathematics, although some time was given to English grammar, logic, geography, rhetoric, and philosophy. In the senior year the Greek Testament was prescribed, with Locke's *Human Understanding*, Clap's *Ethics*, and the occasional addition of such books as Edwards *On the Will*.

At Harvard, about this time, the first significant change in the colonial curriculum permits those who are not preparing for the ministry to take French instead of Hebrew. But modern languages are everywhere regarded with suspicion, both by the defenders of the classics and by the defenders of orthodox religion. Before the close of the century considerable attention is given to scientific studies, beginning with a course of lectures on Natural History for "such students as shall obtain permission under the hand of their parents or Guardians to attend." Even more liberal in its recognition of science and government is the course of study adopted at Columbia University, though Princeton and Rhode Island College, under its influence, are not much affected by the new trend. Chemistry, the first science to attain a worthy place in the college curriculum, was first taught in the medical schools of Pennsylvania and Harvard. By 1820 the subject was included in the curriculum of nearly every American college, covering several topics, such as heat and electricity, that were later differentiated under the name of physics.

The decade 1820–1830, as we shall see later, marks a virtual renaissance in higher education in America. Most conspicuous in this movement is Thomas Jefferson and the University of Virginia. "A system of general instruction," he declared, " which shall reach every description of our citizens, from the richest to the poorest, as it was the earliest, so it will be the latest of all the public concerns in which I shall permit myself to take an interest." The curriculum for the University of Virginia, when it was opened in 1825, was one that Jefferson had been constructing during thirty years of study of institutions at home and abroad. The studies were arranged in ten homogeneous groups: (1) ancient languages, (2) modern languages (including Anglo-Saxon), (3) mathematics (including architecture), (4) physico-mathematics (including astronomy), (5) physics, chemistry, and mineralogy, (6) botany and zoölogy, (7) anatomy and medicine, (8) government (history being interwoven with politics and law), (9) municipal law, (10) ideology (including ethics, rhetoric, and fine arts). This program was not only the most comprehensive of its time, but was the first university curriculum in America to be administered under a virtually complete elective system.

It was between the years 1820 and 1830 that Charles Follen became instructor in German at Harvard College, and George Ticknor, under the influence of Göttingen and more especially the University of Virginia, developed the department of Modern Languages at Harvard College, and Henry W. Longfellow, who was to succeed Ticknor at Harvard, was elected instructor in the French, Spanish, Italian, and German Languages at Bowdoin College. But at most of the colleges French was permitted merely as an "extra" study, a social accomplishment for which a special fee was charged. At the same time the faculty of Amherst College announced a Science Course in which French and Spanish were substituted for the Latin and Greek of the traditional course. The University of Vermont made a similar abortive venture. At Norwich University in Vermont, Captain Partridge advertised most of the undergraduate studies of our present classical, technical, and military schools, and all under an elective system and unfixed term of residence. Similar freedom of opportunity in the academies of the time was one influence in the broadening of the college curriculum. During this same decade Rensselaer Polytechnic, the first technical school in this country, was established, and economics found a place at Harvard, Yale, Columbia, Bowdoin, Dartmouth, and Princeton. American translations of Say's *Political Economy* and mathematical texts of Laplace and La Croe gave an impulse to these studies. The distinctly modern trend of this decade in the history of the college curriculum is well shown by the inquiry of the Visiting Committee at Bowdoin College, "whether the course of instruction ought not to be more of a practical and less of a scholastic character, and to this end whether the study of the Greek language in this College ought not to be optional with the student." Yet in this same decade Yale University gave its powerful influence to a retroactive movement. The report of its committee on a liberal course of study, published in 1827, prescribed every study that a liberal education demanded, and attempted to place the entire curriculum on a basis of formal discipline and to fix it once and for all in final perfection. The doctrines of this Report not only hindered progress at Yale throughout the century, but cramped college programs wherever the influence of Yale was felt. Western Reserve College (now University) aimed to become the "Yale of the West," and many another little Yale preserved its conservative traditions in the West and South.

It was in 1822 that William and Mary College established the first professorship in history. Such teaching of history as had long been given by professors in the classics and in theology was unsystematic and subsidiary to the traditional college subjects. Even after Jared Sparks, in 1839, became the first professor of history at Harvard College, the subject received but scant recognition in most colleges, and this as incidental to politics or philosophy. It was not until after the Civil War that Yale established a chair of history. History and economics as we know them to-day in American colleges are modern subjects.

From the remarkable development of the third decade until the close of the Civil War, the development of the college curricula under the influence of such ideals was necessarily slow. The "new" ideas adopted at Cornell in 1867 are in essence those of the Amherst report of 1826. The whole period was one of conflict between the old doctrines and the *Lehr- und Lernfreiheit* that inspired many an American student in Germany with a truly liberal idea of university study. If any date indicates roughly the final dominance of German ideals and the consequent beginnings of the modern period, it is the year 1869, when Charles W. Eliot became president of Harvard University.

During the past half century the college developed its curriculum under the pressure of institutions above it and below it. The first colleges in America adopted the medieval arts course as it had survived in the modified curricula of English universities, the dominant purpose of the course being general rather than special training. Presently, the traditional professional schools of law, medicine, and theology took their places beside the arts course. Later, under German influence, came the graduate school of arts, with its emphasis on special, technical training, in contrast to the general preparation of the older arts course. The professional schools and the new graduate school pressed on the college curriculum from above, each demanding a part of the older arts course. With rare exceptions the new graduate arts courses with their new ideals were not conceived and maintained as separate institutions. At the same time the American high school, growing rapidly in public favor and in recognition of the needs of the great numbers who could not go to college, brought its influence to bear on the college curriculum from below. Between these two millstones, even the venerable arts course, protected by tradition, ever reluctant in its response to public demands, was nevertheless profoundly modified. And the pressure is steadily increasing. Never before has the college felt from all sides such insistent demands for reorganization.

As the dominant influence on the early curricula was English, and later French, so the dominant influence during the last half of the nineteenth century was German. Throughout the century the history of the college curriculum is the record of institutions, under conservative influences, forced by the growth of human knowledge and the demands of an increasingly complex civilization, to take up one new subject after another, and present them in more vital relations to present social, industrial, and political needs. It is in response to such felt needs, rather than in conformity with any theory of what should constitute a liberal education, that economics and sociology, in numerous branches, history, government, and allied subjects, have now such prominent places in the colleges of to-day. Courses in education, for example, were offered twenty-five years ago in barely half a dozen higher institutions; to-day they are found in nearly three hundred. Equally noteworthy during this period has been the development of college instruction in English language and literature. In 1846 the Lawrence Scientific School was established at Harvard to offer a course parallel to the classical course and leading to the degree of B.S. From that time to the present day, at first slowly and then rapidly, scientific courses have taken their place in nearly all colleges, and have risen from suspicion and from the real inferiority of their beginnings, until to-day the problem in many institutions is to save the traditional A.B. course from being crowded out by the more practical scientific studies. The adoption of the laboratory method has quickened the study of the sciences that thus edged their way into the programs of a century ago, and at the same time has brought due recognition to geology, biology, and psychology. Finally, the general adoption of the elective system, with or without requirements for concentration and distribution of studies, has left the subject matter of the curriculum open to indefinite development, unhampered by the protective tariffs imposed by the formal discipline theorists of earlier days.

W. T. F.

ADMINISTRATION OF THE COLLEGE CURRICULUM. — The Elective System. — On pages 63–65 is traced the development of the college curriculum and incidentally of its administration on a prescribed or an elective basis. While the University of Virginia, under the influence of Jefferson, offered the first definite example of freedom of choice of studies on the part of the student and an embodiment of what is now called the elective principle, yet here the principle was controlled by the following faculty rule: "The degree of graduate shall be conferred on those only who have acquired an accurate and extensive knowledge of the subject of one or more of the classes, or in any single language. But it is to be understood that in all cases the candidate shall give the faculty satisfactory proof of his ability to write the English language correctly." The idea of the elective principle was carried to Harvard by George Ticknor and given slight recognition in the statutes of 1825. Here, as in other colleges later, the elective principle received its first recognition in connection with modern languages; therefore these found their first recognition usually as extra studies.

In 1826 students could take modern languages after the first third of freshman year in place of specified courses in Greek, Latin, topography, Hebrew, and natural science, and seniors might substitute natural philosophy for a part of intellectual philosophy. As modern languages were almost the only subjects available for election, the freedom of choice was less than it appeared to be. Brown University at this time offered its juniors, in the third term, calculus or French, and its seniors, in the third term, Hebrew or French. There were no other options.

In 1834 Professor Ticknor reported that, owing to the adoption and full application of the volunteer system, the amount of study and progress in each modern language had been greatly increased; in some sections doubled within eight years. Yet it appears from the meager offering of electives that, except in modern languages, the administration of the college curriculum remained in 1835 substantially what it had been before the adoption of the statutes of 1825. In 1838 the Corporation provided that students who had completed the freshman mathematics might discontinue the subject, and take in its place natural history, civil history, chemistry, a course in geography, and the use of the globes, or studies in Greek and Latin additional to the prescribed course. It is suggestive of the early difficulties in providing any real freedom of choice that the college, after announcing this apparent extension of the elective system, felt obliged to add the warning that the college might not be able to provide the proposed alternative of natural history, civil history, and chemistry.

Following the adoption of the new curriculum of 1841, various regulations were made each year. They illustrate the way in which courses of study have been patched up, with rare exceptions, throughout the history of the American college. Any one who traces the varying fortunes of various subjects in the administration of almost any college is at a loss to discover evidence of sustained and enlightened leadership. Upon the accession of President Everett at Harvard, in 1846, the advocates of the elective system and the opponents of any change contrived to patch up a compromise curriculum. Although it probably satisfied nobody, it was prescribed with little change for the next twenty years. This program permitted juniors to elect three of the following studies: Greek, Latin, mathematics, German, and Spanish. For the seniors, Italian was added to the elective list. All other studies were prescribed.

President Sparks, an opponent of the elective system, discovered in 1852, the last year of his administration, a condition which has remained an unanswerable argument against the rigidly prescribed college curriculum. "The voluntary system," he said, "is still retained to a certain extent, rather from necessity than preference. The number and variety of the studies for which the university has provided instruction are so large that it is impossible for any student, within the period of four years, to give such a degree of attention to them all as will enable him to acquire more than a limited and superficial knowledge from which little profit can be derived."

In 1856, through another curtailment of elective privileges, the system reached its lowest ebb, and here it remained until after the Civil War. The faculty of 1865–1866 (twenty men with 414 students) was no better prepared to provide a broad curriculum than the faculty of twenty years before. Yet it set out at once upon that policy of decreasing prescribed studies and increasing elective studies which Harvard College followed consistently during the long administration of President Eliot.

The curriculum was no longer at the mercy of chance and compromise: a principle was to guide the administration of studies at Harvard College for the next forty years. In 1872 the senior year became wholly elective; in 1879 the junior year; in 1884 the sophomore year; and in 1894 the single absolute requirement that remained in the entire college course — English A — could be anticipated by an entrance examination. Any one who wishes to follow in detail the development of the system at Harvard College under the leadership of President Eliot, should read with care his annual reports and those of ,the Dean of Harvard College. Abundant materials are there, all of great value to men of every shade of opinion regarding the merits of the system that President Eliot so long and so ably defended.

Elective System in other Colleges. — The reform movements of the third decade of the nineteenth century were not confined to Charlottesville and Cambridge. In 1826 the first volume of the *American Journal of Education* called for reforms in the established system of collegiate education. In the same volume, Captain Partridge advocated certain reforms which he had already achieved in his school at Northfield, Vt. In that institution, which became Norwich University, neither the program nor the length of the course was prescribed. It was in 1825, also, that the trustees of Bowdoin College voted to establish a professorship in modern languages, and to take up the whole question of the curriculum in a thoroughgoing manner. A few years later, the Visiting Committee changed their earlier tentative suggestions to a declaration in favor of elective studies.

In the same year, 1826, the faculty of Amherst College published a report clearly setting forth the need of a more liberal administration of the college curriculum. One of the results was the adoption of the first clearly conceived division of college studies into a classical course and a scientific course. The previous year, students at Amherst had but a single option, "recitations in Hebrew twice a week, if desired." Within a few years the whole college was again confined to one rigidly prescribed course.

Toward the middle of the century the most enlightened utterances concerning the American college were made by Francis Wayland, President of Brown University. In his *Thoughts on the Present Collegiate System,* he protested against continuing to force all students through all subjects, regardless of their interests, aims, or capacities. He showed how superficial nearly all instruction had become because of the overloaded curriculum. Union College, for example, in 1849, mentioned thirty-three subjects for juniors and seniors. Maryville College, in Tennessee, prescribed seventy-seven subjects for all students. President Wayland declared that the amount that colleges were trying to teach under the prescribed régime had doubled, if not trebled, while the time available remained exactly the same. (See COLLEGE COURSE, LENGTH OF THE.) It was inevitable that such programs should break down of their own weight. W. T. F.

PRESENT TYPES OF COLLEGE CURRICULA. — A comparison of the courses of study in the different colleges and universities of the United States reveals variations so great that common principles are not obvious. They vary from those in which the whole course of study is prescribed to those in which almost everything is elective; and between these extremes there are many forms, and seldom two alike. A course of study usually proves, however, to be the result of an attempt to carry out one or more of four different purposes. These are: (1) To include those subjects which by virtue of their content, their practical value, or their value for mental discipline, are regarded as essential to a liberal education. (2) To provide for a varied and broad education and to prevent too early and too narrow concentration in some one subject or field. (3) To prevent, on the other hand, too great a diffusion of effort and to insure a certain amount of concentration. (4) To give to the student an opportunity to exercise his individual preferences and to discover and develop his special aptitudes by making selection among a number of different subjects which are regarded as having approximately equal educational value.

The first demand is provided for in the *prescribed studies* which are to be found in practically every course of study. The second is met either by prescribed courses in several different departments or by the requirement that courses be selected from each or several of a number of different groups, or fields. The third is provided for by holding the student to the completion of a number or series of courses in one or more subjects, which are in some cases prescribed and in others elective. The fourth finds scope in the free elective courses, and usually also in the privilege of choosing the subjects in which to concentrate.

Opinions differ regarding the relative importance of these four purposes and the best way of carrying them out, hence the great variety in college curricula. Three main types may be distinguished: —

A. That in which all the work for the degree is prescribed.

B. That which prescribes part and leaves the rest to the choice of the student. Individual instances vary greatly in regard to the proportion prescribed.

C. That which (1) contains prescribed courses, (2) requires concentration in one or more departments selected by the student, and (3) leaves a certain proportion open for free election.

A. The First Type. — A course of study of the first type is not to be found at present in any institution of prominence, though it is closely approached in the curricula of some of the sectarian institutions. It is the type of the curriculum of a century ago, and it existed with only slight modifications for many years. The increasing number of subjects which demanded recognition made it impossible to include everything in the curriculum, and some slight measure of choice, usually among closely related subjects, came to be allowed. The increasing demand, on other grounds, for privilege of election led to modifications more or less extensive.

B. The Second Type. — The second type is of very frequent occurrence. It was the form taken by the curriculum in most colleges when the movement in the direction of the elective system began to gain strength. In some cases very little was left to the student's choice, in others, almost everything; but in most cases there was a compromise, with the advantage ordinarily rather in favor of the prescribed courses. Such a curriculum usually makes some provision for each of the four demands.

Haverford and Union colleges furnish good illustrations of this type. In the course for the A.B. degree at Union College the work of the freshman year is prescribed. It includes Greek, Latin, rhetoric, mathematics, physiology, gymnastics, and either French or German. In the sophomore year the student is required to take Greek, Latin, English and rhetoric, physics, hygiene, German or French, and history or mathematics. In the junior year English and rhetoric, logic, psychology and ethics, geology, astronomy, and evolution are prescribed, while seven out of sixteen year-hours are elective. In the senior year English and rhetoric, economics and sociology, are prescribed: thirteen out of seventeen year-hours are elective. Such a course of study provides breadth and comprehensiveness by including among the prescribed studies certain courses in each of several fields. Language, literature, philosophy, mathematics, natural science, and the social sciences are all represented. In many colleges history is included in the list of prescribed studies. A fair measure of concentration is required in Latin, Greek, English, and rhetoric. The twenty elective year-hours give the student opportunity either to concentrate still further in a few departments, or to divide his work among many.

A very different example of the same general type is found in the curriculum of the Schools and Colleges of Arts, Letters, and Sciences of the University of Chicago. In it the elective principle receives more recognition. Certain courses are prescribed (nearly 40 per cent for the A.B. degree). Certain others are prescribed, if not offered at entrance; and the rest, normally about 50 per cent, are elective. Twelve "major" (*i.e.* courses meeting four or five times weekly for one quarter year)[1] must be "senior" courses (*i.e.* belonging to the "Senior College" or the last two of the college years). *Not more* than fifteen "majors" may be taken in one department. There is thus a wide field for election, with no definite provisions for concentration outside of the prescribed courses, nor for distribution outside of these and the limitation of the number of majors that may be taken in one department. For the A.B. course the prescribed subjects are one "major" in philosophy, one in psychology, three in Greek, three in Latin, two in English, two in mathematics or science, and one in public speaking. There are four other courses of study, one for the B.S. degree, two for the Ph. B., and one for the Ed. B. They differ in detail and in the amounts of prescribed and elective work respectively, but the plan is the same in all.

The former Harvard curriculum, in which almost the whole course was elective, was an extreme form of this type.

C. The Third Type. — The third type is found in many progressive institutions, and it has been steadily gaining ground. In this type the prescribed courses provide for the subjects which are regarded as indispensable; usually they provide also for a certain amount of distribution, and in some cases for a certain amount of concentration, but in a good many cases the prescribed courses are so few as to be of little use for such purposes. Besides the minimum of concentration which may be insured in this way, there is an additional requirement for concentration in one or more subjects (usually called *major* and *minor* subjects) which the student may select from a number of departments, divisions, or groups.[2]

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[1] The term major describes ordinarily the subject in which the student chooses to specialize. See the Third Type of Curriculum. The usage at the University of Chicago is not that generally recognized.

[2] The term "group" means usually a division made up of closely related subjects, *e.g.* natural sciences. At Johns Hopkins it means a whole course of study in which two or more closely related subjects are central. At Princeton it means a grade, "group 1" being about equivalent to grade A. At Yale "group" is almost synonymous with "department." An "examination group" is made up of the subjects for which the term examinations fall on the same day and hour.

Further specific provision for distribution is present usually, but not invariably.

The free electives may of course be employed in the direction either of greater distribution or of greater concentration.

Individual instances vary greatly, and before comparing representative cases it will be well to consider more closely some of the elements in this type of curriculum.

1. *Prescribed courses* are a characteristic feature, though in some cases they are very few in number. The subjects which are prescribed, even for the A.B. degree, are seldom exactly the same in any two institutions, and in many cases the differences are very great. English composition is the only course prescribed in more than one half of the ninety-two leading institutions, representing all types; but English, including Composition or Literature or Rhetoric, or any two or all of these, is prescribed in eighty-seven of the ninety-two. Latin is prescribed for the A.B. degree in thirty-one out of ninety-two; Greek in only thirteen; French in six; German in seven; a foreign language, with or without some choice as to which it shall be, in seventy-seven. Trigonometry is prescribed in forty-one of the ninety-two; solid geometry in twenty-seven, advanced algebra in thirty-seven; analytical geometry in thirteen; calculus in three; mathematics, including one or more of these, in sixty-seven. As a rule the subjects which are prescribed are those which were a part of the curriculum of half a century ago, though several newer subjects appear in the list, and one of them, physical education, ranks high in the list of prescribed subjects.

The following table shows the frequency with which a few certain broadly defined subjects appear as prescribed studies in four different classes of institutions.

Subjects Prescribed for the A. B. Degree in

	41 Endowed Colleges	14 Endowed Universities	9 Colleges for Women	29 State Universities
History	19	7	6	15
Philosophy . . . . (Phil. Log. Eth.)	16	8	8	8
Psychology . . .	18	2	6	1
Bible Study . . .	16	1	6	
Natural Science . .	26	11	9	15
Foreign language . .	32	12	9	24
English	37	14	9	27
Mathematics . . .	32	10	7	19
Physical Education .	19	7	3	12

Subjects and Groups. — History and mathematics may be regarded as *subjects*. The term "natural sciences" seems rather to indicate a *group* of subjects. Groups of subjects were the inevitable outcome of the attempt to grant some freedom of choice without giving up altogether certain kinds of subject matter, or of discipline. In natural science some colleges prescribe physics, some chemistry, some require one or the other, some require one from a group which includes all the natural sciences. The tendency has usually been toward an enlargement of such groups, limited in many cases only by lack of equipment and of teaching force. The existence of prescribed *subjects* in a curriculum implies that there are certain specific things which the holder of a bachelor's degree should know, or should have learned to do. The substitution of a *group* for a *subject* represents the view that he should know a certain *kind* of thing, with the privilege of some degree of choice as to which thing of that kind he shall study.

The curriculum of Columbia College requires that every candidate for the A.B. degree shall study English composition and literature, trigonometry, solid geometry, advanced algebra, European history, logic and scientific method, certain Latin authors, two years of French *or* German, physical education, and one or more of a group of laboratory sciences.

The curriculum at Harvard requires the student to study rhetoric and English composition and French or German, and to select studies from *each* of four different groups, viz.

(1) Languages, literature, fine arts and music.
(2) Natural sciences.
(3) History and political and social sciences.
(4) Philosophy and mathematics.

In each case there is provision for study in certain particular fields and for a broad course of study. Harvard obviously allows to the student a wider latitude in the selection of what he shall study in a given field. He need not study philosophy, history, nor languages, if he prefers mathematics, political science, and the fine arts. These two courses of study represent typical methods for securing breadth, and typical attitudes with reference to the question of indispensable subjects.

2. *Provisions for Concentration.* — The feature most common to all cases of this third type is the method of providing for concentration. Some provision may be made, as we have just seen, by means of prescribed courses, but in addition to these the student is required to specialize to a certain extent in one or more subjects, which he is permitted to select with more or less freedom. The courses making up the specialized work in a given subject (a *major* or *minor* subject) must ordinarily form a sequence or be of graded difficulty: only a minimum of the work may be of an elementary character. Harvard now requires that six courses should be taken in one department or recognized field for distinction. Columbia requires two three-year sequences (a sequence is made up of connected courses of graded difficulty in one department), one of which, for the A.B. degree, must be chosen from a group including languages, literature, history, and philosophy. Cornell requires ten year-hours, during the junior and senior years, in one of twelve groups.

The degree of concentration required in different colleges and universities varies greatly. In sixty-eight institutions selected on the basis of the comparative simplicity of their regulations, the median case falls in the 18–20 per cent group: half the cases fall in the conspicuous 12–22 per cent mode: the range of concentration requirements is from 6 to 35 per cent of the total degree requirements. See Table.

PERCENTAGE OF TOTAL WORK REQUIRED IN MAJOR SUBJECTS

Per Cent	23 State Universities	13 Endowed Universities	7 Women's Colleges	25 Small Colleges	Total
6–7.9				1	1
8–9.9				1	1
10, etc.	1		1	1	3
12	1			4	5
14	2	1	1	5	9
16	3	1		3	7
18	5			1	6
20	1	2	2	1	6
22				1	1
24	2		2	2	6
26	1				1
28		2			2
30	1			2	3
32		1	1	1	3
34		1			1

3. The curriculum of this type usually permits the student to elect from one fourth to one half or more of the work of the course. He may therefore study a wide variety of subjects, if he so desires, or he may (in most cases) specialize still further in the subjects of his choice.

Further Illustrations of the Third Type. — Harvard and Columbia Colleges have already been cited as illustrations of this type of curriculum. Yale College furnishes an example of a variety of this type which has found much favor. On a basis of a certain number of prescribed subjects (which are, in this instance, only indirectly prescribed), there is built up a set of major and minor courses which must among them represent each of a small number of groups. These courses are usually chosen at the end of the freshman year. The Yale curriculum requires the student to take a major (connected graded work of at least twelve hours) and one minor (connected graded work of at least 5 hours) in one of three main divisions, and one minor in each of the two other divisions. The divisions are: (1) languages, literature, and the arts; (2) mathematics and the physical and natural sciences; and (3) philosophy, education, history, and the social sciences. Further provision for concentration is made in the requirement that the student continue for one year the study of three of the subjects (within the limits of Greek, Latin, French, German, English and mathematics) which he offered for admission. Such a curriculum makes it necessary for a student to get more than a smattering of at least three or four subjects. It leaves him free to concentrate most of his work in a very few subjects, which, however, must not all lie in the same field. (See YALE UNIVERSITY.) A four-group system, such as that of Harvard, and still more, a six-group system like that of the University of Virginia requires an acquaintance with a larger number of the great fields of knowledge, but in most cases, except those in which there is a wide variety of prescribed courses, it is possible for the student to leave out of his course of study certain of the subjects which were formerly regarded as essential to a liberal education.

The course of study in the academic department of Princeton University presents another variety. All the studies of the freshman year and three courses out of five in the sophomore year are prescribed. These studies include Latin, Greek, mathematics, modern language, English, physics, and philosophy. At the end of his sophomore year the student chooses his department for the junior and senior years, but as this choice is largely conditioned by his selection of electives in the sophomore year, he must choose to eliminate certain departments at that time. There are four divisions, each containing one or more departments: *A*. (1) philosophy, (2) history, politics, and economics; *B*. art and archæology; *C*. language and literature (1) classics, (2) English, (3) modern language, Germanic section, (4) modern language, Romanic section; *D*. mathematics and science (1) mathematics, (2) physics, (3) chemistry, (4) geology, (5) biology. In his junior year the student must take all the junior year courses offered by his department. They are usually two in number, sometimes three. In any case three of his five courses must be in the division in which his department lies; one course must be outside that division, and the remaining one is left to his free election. In the senior year he must take three of his five courses in his department, or if not so many are given, he must take three in the division in which his department lies.

In this curriculum full provision is made for concentration. The student must take six courses in his department (if so many are given) in addition to the prerequisite sophomore subject, which is usually in the same department, making frequently seven in a given field out of a total of twenty courses for the degree. The prescribed courses provide for a good measure of comprehensiveness, and the requirement that one junior year course be taken outside the chosen department looks in the same direction. Eleven departments are open to the candidate for the A.B. degree at the end of his freshman year, and although his choice of sophomore electives limits his field of selection at the end of that year, he would usually still find several different departments open to him. This is the most important field for the exercise of election, since the number of free electives is small.

Another important variety is illustrated in the curriculum of the college of Johns Hopkins

University. The curriculum is made up of groups, but these groups differ from the groups spoken of above in that each group is a complete course of study containing (1) certain subjects in common with all the other groups; (2) certain others peculiar to itself; and (3) optional subjects. There are five of such groups: (1) ancient languages; (2) modern languages; (3) history and political economy; (4) mathematics and physics; (5) chemistry, biology, and geology. In each of these groups the principal subjects must be studied for at least two years. In the ancient language " group " the course is as follows: first year, Latin, Greek, *English composition*, *mathematics*, *natural history;* second year, Latin, Greek, English literature, *general history*, *French* or German, *vocal training;* third year, *physics*, *German* or French, *forensics;* with Greek and Latin advised and one course a free elective; fourth year, philosophy with Latin and Greek advised and two courses elective. The subjects in italics are prescribed in each group, except that in some of them another laboratory science replaces natural history, and in some political economy replaces history. Physical exercises also are prescribed. The student must choose his " group " on entering. The choice is virtually among several curricula of the second type with three fourths of the work prescribed and one fifth more advised, leaving about one seventh to entirely free election. Breadth and concentration are well provided for. After the initial choice, election plays but little part. The College of the City of New York has a similar curriculum.

The five different courses for the bachelor's degrees at the University of Chicago bear to one another a relation like that between the different " groups " at Johns Hopkins. In fact, every college which offers a course of study of the second type for each of two or more degrees might be regarded as having one course of study of the third type, the student being required to select his group or major on entering college.

An extreme variety of the third type is found in the curriculum of Leland Stanford Junior University. The prescribed work is reduced to a single semester hour in English composition, and that may be offered for admission. There is no grouping of subjects. The student is required to select a major subject in some one department. That department has the authority to require the completion of this major subject, and also of such minor subjects in other departments as may be considered necessary or desirable collateral work; the major and minor subjects taken together are not to exceed one third of the undergraduate course. No further specific provision is made for the inclusion of studies from the several fields of knowledge. Almost everything is left to the discretion of the student and of the department of his major subject.

In by far the larger number of cases the student selects the subjects in which he is to specialize at or before the beginning of the sophomore year, and pursues his studies in them for at least three years. In a few instances, as for example at Johns Hopkins, he must make his selection at the beginning of the freshman year. In other cases, as at Princeton, he may postpone his choice till the beginning of the junior year.

In most colleges the adoption of a curriculum of the third type has followed a trial of one of the second. At Johns Hopkins there was a very early attempt at the construction of a curriculum of the third type, and the present curriculum at that institution is simply a modified and improved form of that adopted when the collegiate department began its existence. Johns Hopkins deserves the credit of having established the first successful curriculum employing the so-called " group system."

The Group System. — The term " group system " is usually taken to mean a course of study in which a student is required to concentrate in one or more fields, these fields or groups being made up of related subjects. Ordinarily the student is required to select subjects from each group. The essential principles of such a system, *i.e. systematic* concentration and diffusion, may be present, however, in a curriculum which does not arrange the departments in groups (cf. Columbia). The term " group " is not universal in this sense; at Yale the broad fields are called divisions, and at Johns Hopkins a group is a whole course of study. The third type of curriculum, as previously described, includes all cases of the group system and others employing the same essential principles.

The Elective System. — No separate type has been assigned to the elective system. Strictly speaking, there is no elective *system;* there is an elective *principle*, and it is one of the four employed in the construction of practically every modern curriculum. The privilege of election appears at various points in the student's college career. Usually he may choose between two or more bachelor's degrees. In those cases in which specialization is required, he may choose the subject or subjects in which he will specialize. In many cases, he may choose which modern language, natural science, etc., he will follow to satisfy a prescription. He is usually allowed a certain number of free electives. But there is no curriculum which is an illustration of the elective principle alone. It is simply *one* of the central ideas in educational doctrine as exemplified in American colleges.

Courses of Study for the Several Bachelor's Degrees. — Most colleges and universities offer more than one bachelor's degree in courses in the liberal arts and sciences. The degree of Bachelor of Arts has as its most frequent alternative that of Bachelor of Science. The degrees of Bachelor of Philosophy and Bachelor of Letters are also of frequent occurrence. There is, however, little uniformity regarding the requirements for any one degree. Some colleges (for example, Princeton) require both Latin and Greek for the A.B. degree. Some require Latin only (Columbia, Williams, etc.). Some do not require any work in ancient languages.

The B.S. degree frequently means simply that the student has completed a course of study but is not entitled to the A.B. degree, usually because he has had no Latin, or if Latin, then no Greek. There is a tendency, however, to make the B.S. degree stand for some amount of specialization in science. The B.L. degree implies some amount of specialization in language and literature. The Ph.B. sometimes takes the place of the B.L., but its significance is, if possible, less constant than that of any of the others. (See DEGREES.)

Courses for Honors. — This feature so characteristic of English and Canadian institutions finds but slight favor in the United States. Two universities now offer special courses of studies for honors. In 1906 Princeton University established a course for special honors in mathematics and physics. The candidate for honors must receive no grade lower than the second (out of five grades). In 1909 a course for honors in the classical humanities was established. In this department the student begins his work for honors in the junior year. There are other differences, but the plan as a whole is similar to the one just described. In 1910 Columbia adopted a program of studies for the degree of A.B. or B.S. with honors. The student not a candidate for honors takes, besides certain prescribed studies and electives, two series of "sequential" courses (*i.e.* connected graded courses for three years each). The student who desires to become a candidate for honors chooses toward the end of his freshman year one department in which he will offer honor work. He is then assigned to a representative of that department, who acts thereafter as his faculty adviser.

The requirements for the degree with honors include a final examination in all the courses taken for honors. (See HONORS.) A. L. J.

LENGTH OF THE COLLEGE COURSE. — The first course of study planned by President Dunster was a three-year course. (See *New England First Fruits.*) Soon, however, he changed his view, stating that "four years, more or less, in college is necessary for students to remain, before they shall become baccalaureates, and an entire seven years before they shall receive the Master of Arts." And in 1654 it was recorded that "First degrees are denied to those of three years' standing." Yale followed the traditional Harvard course. In the middle of the eighteenth century the University of Pennsylvania covered at first three years, and so remained until after the Revolution. With the reforms of William and Mary in 1780 an elective system was adopted and the length of term made variable. After outlining a remarkably comprehensive program of studies, for which he recognized that three years was too brief, Jefferson concludes, "Circumstances must always be regarded in the execution of every plan." President Madison wrote (1780): "The time of taking a degree was formerly the same as in Cambridge, but now depends on the qualification of the candidates." During the early nineteenth century the flexibility of the academies in adjusting themselves to the needs or demands of a community produced a strong pressure on the college toward modifications of its inflexible structure. President Wayland of Brown advocated courses parallel to the arts course, and a greater flexibility. "There is nothing magical or imperative," he says, "in the term of four years, nor has it any natural relation to a course of study."

Except for the rare instances already cited, the college course held rigidly throughout the country to the four-year period, from the middle of the first century of colonial settlements to recent times.

Within the last quarter century, however, this phase of college life has been subjected to keen criticism. The very first article in the first number of the *Educational Review* (1891) was one by Daniel C. Gilman on "The Shortening of the College Curriculum." Discussions concerning the length of the college course have been numerous, and several plans for the administration of the curriculum have been adopted looking toward greater flexibility as to time requirements for the A. B. degree. For many years President Eliot had urged the reduction of the time of required residence. In his report for 1883–1884, he advised either the formal adoption of a three-year course or plans whereby a majority of students would be encouraged to complete their work in less than the traditional period. The faculty of Harvard College recommended to the Corporation, in 1890, four steps looking toward a three-year course. Only one of these was agreed to by the Overseers, namely, "When a student enters college there shall be placed to his credit . . . (1) any advanced studies on which he has passed in his admission examination beyond the number required for admission, and (2) any other college studies which he has anticipated." The same year (1890) Columbia University adopted another plan enabling students to shorten their college and professional studies by one year, by which seniors could elect their studies from courses offered by the faculties of philosophy, mines, laws, and political science, and thus be prepared, upon graduation to take up at once their second year of professional study. Other universities offered similar opportunities for the overlapping of collegiate and professional courses. At about the same time the University of Chicago (*q.v.*) under the leadership of President Harper offered an original answer to the question by providing a four-year course and a two-year course, and permitting students of exceptional ability to do the work in three years. Those who completed the work of the two-year course, or Junior College, were called Associates in Arts. (See, *Educ. Rev.*, Vol. 19, p. 411.) The devisors of the plan expected the following five results: (1) that many students would give up work at the end of the second year; (2) that many students who otherwise would not go to college at all would take the two-year course; (3) that professional schools would be able to raise their standards of admission; (4) that academies and high schools would be encouraged to develop higher work; (5) that many colleges would be satisfied to do only the Junior College work. As might have been expected, the whole plan met the general opposition of the colleges.

Still another plan for enabling the better students to graduate in three years without taking an excessive number of courses was proposed by President Hyde of Bowdoin College. It is known as the " Credit for Quality " plan. It allows courses passed with high grades to count more toward a degree than courses passed with low grades. The plan has been in operation for some time at the University of North Dakota, and to some extent at Columbia University, Chicago University, and the University of Missouri.

A decade later the discussion concerning the shortening of the college course was taken up with new vigor. Between 1900 and 1905 no less than fifty articles appeared on the subject. Before the proposal to shorten the course to three years had found much favor within the conservative walls of American colleges, when only two — Johns Hopkins and Clark — had frankly established a three-year course, President Butler of Columbia gave a new impetus to the whole controversy by advocating a two-year course for the A.B. degree. In his *Annual Report* of Oct. 6, 1902, he favored a two-year course for admission to the higher schools of the university on the ground that a longer course unduly postpones the period of self-support for those who enter the professions. He favored removing the bachelor's degree from the artificial position to which it had been raised by the extension of high school courses, and conferring it upon the graduates of a two-year course, reserving the degree of Master of Arts for the graduates of a four-year course. The same year, 1902, Harvard College announced that it would at once confer the degree of A.B. on students who completed the requirements in three years, instead of requiring students, out of deference to a harmful tradition, to wait a year for degrees already earned. Similar plans were at once adopted by Brown University and by the University of Pennsylvania.

Growing importance attached to the question after Harvard and Columbia began to insist on the A.B. degree as a prerequisite for admission to the technical schools. While this tendency met with much opposition at first, the movement has resulted in raising professional standards and has generally been accepted by the colleges as essential.

Only two colleges in good standing have frankly adopted the three-year course as the norm, and discouraged students from spending more than three years in their work for the A.B. degree. These institutions are the collegiate departments of Johns Hopkins University and Clark University. Clark College was favored in the experiment from the beginning by the lack of traditions, by ample funds, by a faculty large enough in proportion to the number of students to do actual teaching in all courses, by a ban on intercollegiate athletics and their accompanying distractions, and by a plan of admission requirements theoretically superior to the traditional methods of the older colleges.

Through all the prolonged discussion as to the length of the college course there appears to emerge substantial agreement among competent judges on these points, all of which have direct bearing on the question at issue. (1) The ordinary high school education is inadequate preparation for professional school studies. (2) A four-year college course between high school and professional school unduly postpones the age at which a man may enter his lifework and support a family. (3) Absolute uniformity in the requirements for admission to professional schools in the United States is at present neither possible nor desirable. (4) The American college, the one type of institution peculiar to the United States, must protect its essential character as a school of liberal culture from the pressure of other institutions. (5) The various degrees stand greatly in need of generally accepted definitions. (6) The work of the General Education Board and of the Carnegie Foundation for the Advancement of Teaching has strengthened the better colleges, intensified the struggle for existence of the weaker colleges, and thus helped to define the kind and length of college course which ought to lead to the baccalaureate degrees. W. T. F.

Administrative Bodies. — No uniform system of college administration can be said to exist in America; the variations are due to historical reasons or difference of constitution, *e.g.* of state and private colleges and universities. But two main types of forces may be distinguished, which may be called constants, *i.e.* found in all institutions, and variables.

(1) In constants are included: (*a*) Trustees; (*b*) Faculty; (*c*) President (*q.v.*), Secretary, and Treasurer; (*d*) Students. (2) In variables are included: (*a*) A legal body usually called Overseers (*q.v.*); (*b*) Dean; (*c*) Bursar; (*d*) Comptroller; (*e*) Visiting Committees; (*f*) Alumni Associations (*q.v.*).

The legal body, which usually calls itself Trustees, is sometimes called Regents or Fellows. The numbers of its members greatly vary, being seldom less than seven and seldom more than fifty. The terms of election vary from those of a close corporation to those of appointment by a denominational society, or, as in the case of a state university, to those of appointment by the Governor of a state or to an election made by the people.

The duties of this legal body are also many and diverse. " They relate to the management of the property both real and personal; to the distribution of the annual income of the university among the different departments of instruction and research; to the appointment of all officers and teachers in the university; to the salaries and retiring allowances; and to the enactment of the rules or statutes under which the regular work of the university proceeds. The Board also passes finally on all the educational policies of the university; but in this function it ordinarily follows the advice of the university faculties, or of the committees to which faculties have delegated their authority on certain subjects." (*University Administration* by Charles W. Eliot, pp. 6 and 7.)

A second legal body is found in a few colleges and universities. This body was introduced in the year 1642 into Harvard College. It is usually called "The Overseers." Yale College was founded with only one legal body.

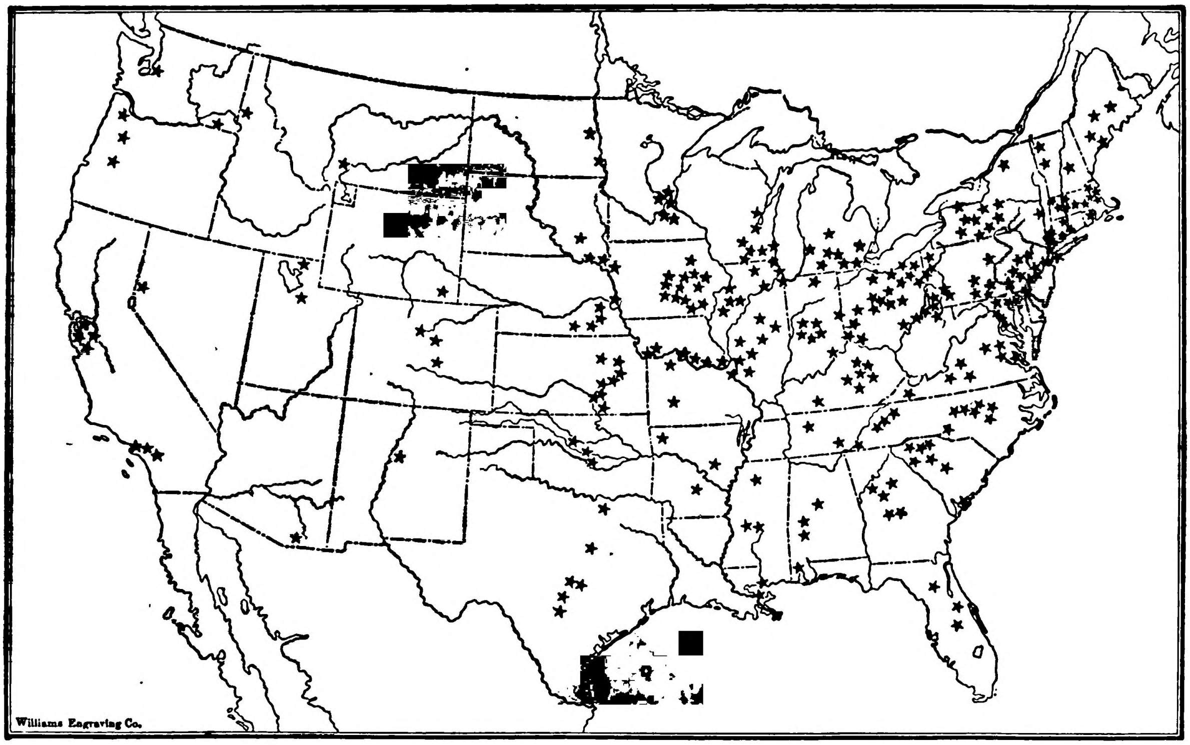
The method of organization with one legal body only is that commonly found. The body of overseers has been criticized on several grounds. It is felt that its very numbers make it unwieldy, and introduce members who are in no way competent to deal with academic matters; that any administrative body should be in intimate touch with the university and its problems; that the fact that members of such a body represent different interests is no guarantee of unbiased and mature decisions. Those who support this view would leave the entire control in the hands of the faculties who are in intimate and daily contact with their problems and are less likely to register undigested and imprudent judgments. (For a complete statement see Dwight's *Travels in New England and New York*, Vol. II, pp. 212, 213.) The arguments which are emphasized in favor of a duplex system of organization differ very slightly from the usual arguments for a second chamber. Instead of hampering the faculty, a board of Overseers would rather act as a spur, for its support could only be secured for plans thoroughly digested and considered by the faculties. The very fact that members of the board are drawn from a wide area and different walks of life lends its opinions weight. As representatives of public opinion such a board is a valuable factor in guiding university policy. Further, one of the important duties, that of inspection of various departments, can be better exercised by an external body than by the faculty itself. (See Eliot, C. W., *University Administration*, pp. 50–53.) C. F. T.

Colleges and College Students, Geographical Distribution of. — The number of institutions bearing the name " college " or " university " in the United States exceeds 800. Of these many are only secondary schools. Others offer a few courses of collegiate grade and enroll a few collegiate students in the upper classes, but most of the work done is of secondary grade. The statements which follow in this article are based upon a classified list of colleges which have enrolled in the regular four college classes, for the year 1908–1909, at least 100 collegiate students or which have endowment to the amount of $100,000. In this category there are in the United States 261 colleges. This list does not include the agricultural colleges nor technological institutions. The geographical distribution of these 261 colleges is as follows: North Atlantic Division, 61; South Atlantic Division, 39; South Central Division, 35; North Central Division, 103; Western Division, 23. In terms of population there is one college in the United States for every 256,956 of white people. By main divisions the proportion is as follows: —

North Atlantic Division, 1 college to 338, 326 of population.
South Atlantic Division, 1 college to 171,929 of population.
South Central Division, 1 college to 286,692 of population.
North Central Division, 1 college to 250,251 of population.
Western Division 1 college to 168,411 of population.

From these statements it will be seen, that in terms of population the Western Division is most fully supplied with colleges, with the South Atlantic Division differing only slightly. The North Central Division has colleges at about the average rate for the entire country, while the North Atlantic Division, which includes New England, New York, Pennsylvania, and New Jersey, has the fewest colleges in proportion to the population.

The following table shows the number of students from the several states enrolled in the four college classes of the 261 colleges listed, together with the ratio of students to whole population. From the tabular statement it appears that the largest number of students are sent from the State of New York and the smallest number from Nevada. There are four states which send less than 100, there are 27 states which send less than 1000, and there are 38 states which send less than 2000 students to college. In proportion to the population California sends the largest number to college and Missouri the smallest. The number of states sending 1 student to 500 of white population or less is 3; 1 student to 1000 or less, 24; 1 student to 2000 or less, 47. (See College and University Student Attendance.) E. C. S.



Geographical Distribution of Two Hundred and Sixty-one Leading Colleges.

	Students	Ratio to Population
Alabama	765	1 to 1308
Arizona	69	1 to 1346
Arkansas	519	1 to 1820
California	3043	1 to 461
Colorado	1134	1 to 466
Connecticut	1331	1 to 671
Delaware	142	1 to 1084
District of Columbia	249	1 to 769
Florida	257	1 to 1157
Georgia	1045	1 to 1130
Idaho	138	1 to 1119
Illinois	4970	1 to 952
Indiana	3710	1 to 662
Iowa	3757	1 to 590
Kansas	1903	1 to 744
Kentucky	965	1 to 1929
Louisiana	330	1 to 2211
Maine	1164	1 to 594
Maryland	694	1 to 1372
Massachusetts	4561	1 to 607
Michigan	2223	1 to 1079
Minnesota	2165	1 to 803
Mississippi	535	1 to 1198
Missouri	1000	1 to 2944
Montana	149	1 to 1519
Nevada	68	1 to 520
Nebraska	1472	1 to 717
New Hampshire	508	1 to 808
New Jersey	1442	1 to 1256
New Mexico	96	1 to 1877
New York	7654	1 to 935
North Carolina	1764	1 to 716
North Dakota	293	1 to 1064
Ohio	5425	1 to 767
Oklahoma	361	1 to 1856
Oregon	511	1 to 722
Pennsylvania	4792	1 to 1277
Rhode Island	597	1 to 701
South Carolina	1139	1 to 489
South Dakota	441	1 to 863
Tennessee	717	1 to 2148
Texas	1642	1 to 1471
Utah	197	1 to 1383
Vermont	392	1 to 874
Virginia	888	1 to 1343
Washington	978	1 to 508
West Virginia	508	1 to 1801
Wisconsin	2553	1 to 806

Problems of the College. — No one who has examined with care the educational writings of the past decade has failed to find abundant evidence that appears to warrant the verdict of the *Nation:* " The college is the least satisfactory part of our educational system, and has urgent need to justify itself." The growing dissatisfaction with the American college has recently culminated in (1) unified protest on the part of secondary schools against college entrance requirements and examinations which, made in the interests of the college, have proved deadening to the lower schools; (2) severe self-examination on the part of colleges as indicated by hundreds of addresses and published articles on the reorganization of the college; (3) the establishment of the Carnegie Foundation for the Advancement of Teaching (*q.v.*) and the effective use of its funds for the purpose of encouraging institutions to meet its standards; (4) the organization of the higher education associations for the special purpose of improving the internal and external conditions of the American college; (5) the increasing difficulties of the denominational college in meeting higher standards and the agitation of the question whether, in consideration of the avowed American policy of the separation of Church and State, any private institution ~~should be~~ exempt from taxation; (6) the occasional application of scientific methods in testing the efficiency of college methods of instruction, examination of candidates, grading of students, administration of the curriculum, etc.

The Problem of College Teaching. — One of the greatest, if not the greatest, problem of the college is that of securing more efficient teaching. Nearly a century ago we began to insist on the need of trained teachers for elementary schools. Our better normal schools and teachers' colleges have provided professional training for secondary school teachers. Not even to-day is there, on the part of administrators, any general recognition of the fact that a professor needs something more than a knowledge of the subject he wishes to teach. But the public is demanding better results; there is a widespread belief that the poorest teaching in the country to-day is found in college classrooms. The problem of developing a pedagogy suited to the needs of young men and women of college age and providing a training that will furnish better teachers for college classrooms is a problem that the leaders of higher education agree must be faced, though few institutions have yet made anything more than tentative beginnings.

Another condition that has given rise to this adverse criticism of college teaching is the lack of competent supervision. In the notable development of expert school supervision during the last half century, college teachers alone have been left without such guidance. Indeed, most of them would consider the critical visit to their classroom of an administrative officer as a violation of academic freedom. It is, as President Pritchett has suggested, one of the weaknesses of all organizations which look toward intellectual and spiritual results, that they tend to evade the accountability which falls to every other human organization. While the *privat docent* in German universities, lecturing on the same subject as the professor, is sure to take away the students of an inefficient teacher, and thus serves as a constant stimulus to the older man, the head professors in American colleges are left as a rule with no obligations to meet any particular standards in their own departments, or to coöperate with other departments for the good of the whole institution.

Problem of Adjustment to Secondary Schools. — The historical origin of this problem of adjustment is set forth in the opening article on THE COLLEGE. The fact is that the American high school was not intended to fit nicely between elementary school and college. It was at first an independent institution, hailed as the "people's college." Gradually, however, on account of the pressure of the colleges and for want of any other definite measure of achievement, high school masters came to look upon preparation for college as the chief function of their schools. This they did although the interests of the majority were thereby neglected and the spontaneity and freedom of the schools were sacrificed. This entire subject is discussed in the following article on COLLEGE REQUIREMENTS FOR ADMISSION (*q.v.*).

Problem of Oversupply. — A problem that confronts a large number of colleges arises out of the oversupply of such institutions, and consequent wasteful and demoralizing rivalry. Local patriotism, real estate booms, sectarian interests, and political jobbery have created more colleges than people are willing to pay for. Even institutions supported by the same state carry on a competition which results in extravagant duplication of courses and equipment, temptations to weakness or dishonesty in maintaining standards, and log-rolling in the legislature. In several states the university, college of agriculture, and normal school or engineering school, instead of coöperating in professional spirit are consuming much energy in petty rivalry and animosity. Whenever such a problem concerns only, or mainly, the institutions supported by a state, the solution is relatively easy. Other states are likely to follow the example of Iowa, in 1909, in abolishing rival boards of trustees and in creating a single state board of control, charged with the duty of seeing that every dollar is well spent and nothing wasted in institutional rivalry. But where the waste is due to the competition of weak colleges under private control, the problem is far more difficult. In one sparsely settled part of the United States, for example, are 7 colleges within a radius of 100 miles. In Ohio are 52 colleges. In Illinois, in addition to several strong institutions, are a score of colleges, no one of which has a sufficient endowment. Other states have an oversupply of colleges for men, resulting in undignified, ungenerous, and extravagant attempts to enroll more men, while not half the women who seek a college education can be accommodated. The problems of such institutions have of late years become intensified, for (1) the strengthening of the strong colleges by the endowments from the General Education Board and by the pension privileges of the Carnegie Foundation has tended toward the benevolent elimination of the weak colleges; (2) the distribution of the graduates of reputable colleges throughout the country and the diffusion of their ideas of what should constitute a college education make it increasingly difficult for the weaker institutions to secure additional funds and students; (3) as new comprehensive and impartial studies of the problems of higher education furnish guidance for prospective benefactors, they are less likely to endow enterprises that have been undertaken, in excess of the demand, through misguided devotion to creed or family or town. Under the decentralized administration of education characteristic of the United States, there is at present no direct means of enforcing combinations and distribution of functions in the interests of the general public. Each state may take steps toward the gradual attainment of such ends by adopting definitions of the terms "college" and "university" and of the various degrees. Meantime, the weaker institutions may be led by their difficulties to then adopt names and pretensions consistent with their possibilities, and thus worthily serve their communities in less ambitious ways.

Problem of the Denominational College. — Of all the institutions in the United States included in the latest report of the Commissioner of Education under the head of colleges and universities, only 50 are controlled by state or city. There are 620 chiefly, if not wholly, supported by private funds. These private institutions have about twice as many students as the public institutions. Over 400 of them are avowedly denominational. About three fourths of these are under the control of Methodists, Presbyterians, Baptists, and Roman Catholics. The rest are known as Lutheran, Christian, Congregational, Reformed, Friends, United Brethren, Episcopal, Universalist, Evangelical, Moravian, Latter Day Saints, Seventh Day Adventists, and Church of God.

Sectarian colleges have been established in the belief that a church, in order to carry out its legitimate work and advance its cause, must control and direct a number of institutions of higher learning in which men may grow up trained in its ideals and devoted to its service. The great pioneer service of sectarian colleges during centuries when the State seemed unable to promote higher education is incalculable. Up to the time of the Civil War, a college with but small endowment and but meager equipment got along fairly well. Since that time the struggle for existence has become more and more severe. To-day the Middle West is dotted with denominational institutions that have long since found it impossible to compete with state universities in equipment, funds, quality of teachers, and power to attract students. The fundamental trouble arises when sectarian colleges are not primarily interested in education but in the propagation of a particular religious faith. Unless there is a change in the present unmistakable trend, unless sectarian interests rally with far greater material aid to the support of their colleges, most of these institutions must either become frankly of secondary school grade, or else must perform what now seems the impossible feat of combining their resources for the maintenance of one strong college where now a dozen suffer a precarious existence. Even if such far-sighted coöperation were possible, the question would still remain whether under modern conditions sectarian interests could not be more efficiently promoted by the method described above than by direct denominational ownership and control of higher institutions. See, for further discussion, Colleges and Universities, Religious and Denominational Control of; and College Boards in Education, Denominational.

Problem of the Small College — The small college may be defined roughly as an institution for undergraduate work with a student body of less than 400. Throughout the history of higher education in America, the small college has been the normal type. The large college is a creation of recent decades. In the year 1850 no college had over 400 students. At that time Yale had 386, Harvard 297, Princeton 232, and Union 266. Dartmouth and Columbia and Amherst had less than 200, Dartmouth having 196, Columbia 179, and Amherst 176. Among other colleges having 100 and more were Brown, with 141, Williams, with 163, Hamilton, with 149, Wesleyan, with 104, the University of Vermont, with 107, and Lafayette, with 100. In point of mere numbers the small college is still typical; more than half of all the colleges belong to this class. Though the small college has been the normal type, yet with the growth of colleges the small college has been brought face to face with new problems.

The place and function of the small college may possibly be best represented by certain contrasts. In a small college the mere fact of a low enrollment permits of the development of those intimate relations between students among themselves and between students and teachers, and a consequent *esprit de corps*, which the large college with large numbers cannot hope to attain. The disciplinary influence of a strong personality can be more widely exercised where the numbers are not so large as to lead to the formation of small groups, factions and cliques. The larger institution on the other hand has material advantages which the small college cannot offer in the way of equipment, teachers, and experts, and at the same time the students through their diverse origins and varied interests react beneficially on each other. To the students of ordinary ability, the small college offers a heartier sense of sympathy and of fellowship; to the student of extraordinary ability, the large college offers richer advantages for higher development and greater increase of his power. To the student who is "working his way," wholly or in part, — and this student is about one in three, — the small college is less expensive, but as a rule it offers fewer opportunities for earning money. The large college costs more, but it is able to grant larger sums from its loan and other beneficiary funds, and, as a rule, to furnish better facilities for self-support. In this comparison it may be said, somewhat interrogatively, that the small college is better fitted to make thinkers, the large college to make scholars; the small college is better fitted to train men, the large to teach subjects; the small college is better fitted to train the individual, the large to discipline the whole community; the small college is better fitted to improve personal character, the large to disseminate truth. Such comparisons obviously do not justify the conclusion that the small college is best for all without reference to their ability, character, age, and needs.

In addition to the college problems already discussed, the small college has certain peculiar problems. One of these is the attempt to attract too many students. That college which, for the sake of numbers, falls below the entrance standard of the colleges with which it competes, either in entrance requirements or in accrediting unsatisfactory schools, is in danger. Such a course means a temporary increase of the enrollment, but a permanent lowering of the college standard.

A second danger lies in abortive attempts to become a university. The greatest source of strength lies in doing well precisely that kind of work which university conditions render more difficult. In its desire to keep up with the times and to thicken its catalogue, it should not encroach on the work which in other countries and formerly in this country was regarded as the distinctive province of the university. Every college of considerable resources in funds is in danger of offering its students more than they can profitably receive. To provide technical training for undergraduates, to attempt to compete with the university, is to misconceive the purpose of the small college. To offer such subjects to the few who wish to remain for graduate work is beyond the means of most colleges and beyond the proper scope of all. The small college owes most of the time and highest service of its faculty to the undergraduates.

A third danger may be found in intercollegiate athletics. In the degradation of scholarship standards for the whole college, this is a factor which all but the blind can see, but which only the bold acknowledge. Not that the athletes as a whole stand conspicuously lower in scholarship than the other students as a whole. The danger lies in the influence of excessive interest in intercollegiate games on the *whole* student body; and in the influence on the minimum entrance and college requirements of the desire to win at any cost. (See ATHLETICS, EDUCATIONAL.) This is particularly true when they persist in competing with universities which draw their teams from ten times the number of men, and they are constantly under pressure, from their "friends" and their own mistaken notions, to admit and retain men whose only qualification is proficiency on the diamond or gridiron.

Two reasons which have hitherto induced men to choose the larger and older institutions have been prestige and educational advantage. But there can be no continued monopoly of either. The difference in prestige — due to age and to the fame of alumni — has been growing less through the years. But now that there are over 800 colleges in the United States. the influence of prestige in determining the choice of a college is not so conspicuously in favor of a few institutions. Stronger motives are governing to-day.

The undenominational small college, which refuses to lower its standard from any notion of the importance of mere numbers; which dedevotes its energies to its own mission as the maker of men and leaves to the university its own distinct work of making specialists; which guards against the evil and employs the good in athletics; which evades the temptation to shift any considerable part of its teaching upon inexperienced, underpaid, and temporary assistants; which sees the extravagance of spending large sums for fine buildings and small sums for strong teachers; which avoids the large-college tendency to substitute mechanism for personality in administration; which is yearly a severer critic of itself than any outside agencies; such a college, open to the accredited graduates of every approved high school, offering a few elective courses in the most important branches of strictly college study, taught to small groups by scholars who are first men, governed by personal kindness rather than by general rules, encouraging various student activities which call for the exercise of every worthy faculty of every student, has a place so secure and so important that all the tendencies to-day in large colleges and in professional schools are serving only to strengthen the small college of this type against its real and supposed dangers.

C. F. T., W. T. F.

Other College Problems. — There are many other college problems that have been much discussed of late and that need further impartial and quantitative investigation. It is beyond the scope of the present work to do more than refer to most of these topics and indicate the main sources of information concerning them. A topical outline of the matters considered in the *Oberlin Report* (1908–1909, pp. 97-206) is the best available survey of the problems that to-day confront the student of the American college.

I. The Quality of the Output.
  A. The Scholastic Efficiency of the Graduates.
    1. In Graduate Schools.
    2. In Professional Schools.
    3. In Technical Schools.
  B. Success of the Graduates in Active Life.
    1. Vocational Success.
    2. In Politics and Statesmanship.
    3. In Social Service.
  C. General Intellectual Efficiency.
II. The Educative Process in the College.
  A. The Government of the College.
    1. The Trustees.
    2. The Executive Committee.
  B. The Administration of the College.
    1. The Organization of Administration.
      (*a*) Officers.
      (*b*) Standing Committees.
      (*c*) The Faculty.
    2. Constructive Administration.
    3. Routine Administration.
      (*a*) Coöperation with the trustees.
      (*b*) Regulation of instruction.
        (1) Recruiting the teaching staff.
        (2) Tenure of office of teachers.
        (3) Adjustment of work of teachers.
        (4) Compensation of teachers.
        (5) Vacations of teachers.
        (6) Supervision of teaching.
        (7) Control of the curriculum.
        (8) Direction of the summer session.
        (9) Oversight of graduate instruction.

- (c) Administrative Relations with Students.
  - (1) Canvass for students.
  - (2) Admission of students.
  - (3) Supervision of work of students.
  - (4) Recording the work of students.
  - (5) Providing aids to general culture.
  - (6) Oversight of the "community life" of students.
  - (7) Supervision of housing and boarding of students.
  - (8) Safeguarding student health.
  - (9) Promotion of social contact with teachers.
  - (10) Administration of discipline.
  - (11) Determining the necessary expenditure of students.
  - (12) Beneficiary aid.
  - (13) Securingappointmentsforgraduates.
- (d) Conduct of the college library.
- (e) Keeping in touch with alumni and former students.
- (f) Coöperation with other institutions, societies, etc.
- (g) Maintaining cordial relations with the local community.
- (h) Participation in the affairs of the outside world.

- C. Instruction in the College.
  - 1. The Teachers.
    - (a) Number of teachers.
    - (b) *Esprit de corps* of the teaching force.
    - (c) Qualifications of teachers.
  - 2. The Work of Teachers.
    - (a) In teaching.
    - (b) In other college duties.
    - (c) In outside work.
  - 3. The Conduct of Teaching.
    - (a) The curriculum.
    - (b) The classes.
- D. Student Work and Life.
  - 1. The Number of Students.
  - 2. The Work of Students.
  - 3. Other Student Activities.
  - 4. The Environment.
  - 5. The Cost of Student Life.

- III. The Cost of the College and its Operation.
  - A. The Organization of Administration.
  - B. The Capital Invested.
  - C. The Annual Income.
  - D. Methods of Augmenting Resources.
  - E. The Annual Expenditure.
  - F. Analysis of Expenditure.
  - G. Elimination of Waste.

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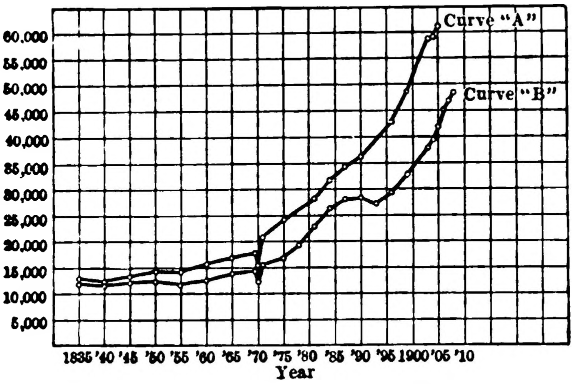
COLLEGE AND UNIVERSITY STUDENT ATTENDANCE. — First among the phenomena, revealed by a study of the modern higher educational system, and bearing all the others in its train, is the remarkable growth and spread of interest in higher education, and the consequent tremendous increase in the number of those pursuing advanced studies and receiving higher training.

Chart I deals with the conditions in Germany as disclosed by a study of educational statistics compiled from official sources.[1] An examination of Curve B of the combined attendance at the twenty-two German universities (including Braunsberg, Prussia) reveals at once a most striking fact. It will be seen that prior to 1870 (the year of the Franco-Prussian war) this attendance was fairly uniform (the yeast of the spirit of 1848–1849 can, however, be seen to have been slightly working), keeping regular pace with the population and thereby betokening a certain stable condition of the social order. Immediately after this date the curve takes a sharp upward bend, and an increase in attendance, growing much more rapidly than the population, is most pronounced. Nor does this increase show the slightest tendency to fall off. It is even more marked in the combined attendance at all the German universities, polytechnic and professional colleges above gymnasial rank, as shown in Curve A. Coincident with the Franco-Prussian war there is a sudden dip, naturally accounted for by the call on young men for military service; and the disturbed political conditions of 1887–1888 show in the form of an offset in both curves, more marked in B than in A.

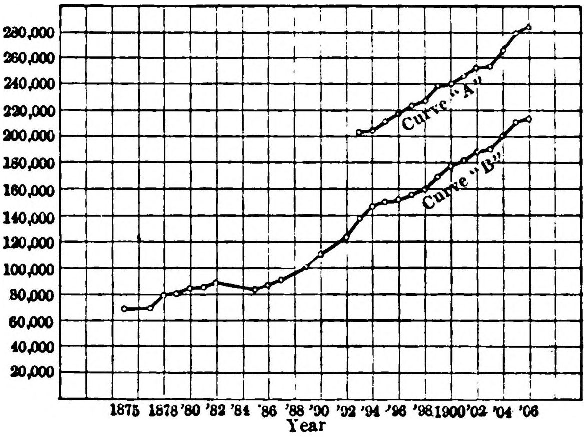


Total attendance of matriculated students at all German institutions of higher education. Curve "A" includes universities, polytechnica, and professional colleges. Curve "B" includes universities only.

At the beginning of the period of rapid development (1870), there was one matriculated student for every two thousand inhabitants, while in 1907 there was one matriculated student for every thousand inhabitants. This denotes twice as widespread a participation in the benefits of higher education; and, involving, as this must, higher personal efficiency, needs, and aspirations, it is not too much to claim that we are well on the way toward an entirely new social order; that we are in the midst of an intellectual renaissance of profoundest import, of a movement which is one of the most significant in the history of the development and progress of the race.

Were Germany alone in this movement, so broad a statement would be unjustifiable — but she does not stand alone, she is simply preceding the other nations.

Chart II deals with the statistics for the United States and is based upon data compiled from annual *Reports* of the Commissioner of Education. Curve B gives the combined attendance at all the colleges, universities, scientific, technical, and professional schools, omitting preparatory departments. Up to the year 1885 is seen a condition of practical stability; but beginning with that year the curve takes an upward bend, and continues with no sign of falling off. There is repeated the same story told by the German curves, but beginning fifteen years later. In 1885 there was one student for every seven hundred inhabitants, twenty years later, in 1905, one for every four hundred — or, if the Normal School attendance is included as given by Curve A, one for every three hundred inhabitants.



Total attendance at all American institutions of higher education, inclusive of men and women and exclusive of students in "preparatory departments." Curve "B" includes colleges and universities for either or both sexes, scientific and technical schools or colleges, professional schools of theology, law, medicine, dentistry, pharmacy, and veterinary medicine. Curve "A" includes all above and normal schools.

Even though the United States shows the same phenomenon, the broad statement might have to be qualified. But the following table (I) shows that the movement is not confined to these two countries. Here it appears that Russia is the only western country of prominence which has not passed Germany's figure of the year 1870, namely, one student for two thousand inhabitants. The strong leading position of the United States and Switzerland is noticeable. France, the other republic on the list, ranks third. The figures for attendance in other countries than the United States have been summarized from data furnished to the U. S. Comissioner of Education by the editor of *Minerva.* It is probable that they understate, rather than overstate, the numbers in those countries which do not issue adequate official educational statistics.

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[1] Lexis, *Public Education in the German Empire;* Ascherson, *Kalender der deutschen Universitäten;* and *Minerva.*

TABLE I

COUNTRY	POPULATION	NUMBER OF STUDENTS IN HIGHER EDUCATIONAL INSTITUTIONS, 1906-07	POPULATION PER STUDENT
United States	83,941,510 (Est. 1906)	283,395 (Incl. Normal Schools) 212,956 (Excl. Normal Schools)	296 394
Switzerland .	3,463,609 (Cen. 1905)	10,511	330
France . . .	39,252,267 (Cen. 1906)	50,935	771
Denmark . .	2,605,268 (Cen. 1906)	3,363	775
Germany . .	60,641,278 (Cen. 1905)	73,020 (Incl. Hearers)	830
Austria-Hungary . . .	46,973,359 (Est. 1906)	51,691	909
Greece . . .	2,631,952 (Cen. 1907)	2,836	928
Italy . . .	33,640,710 (Est. 1907)	33,174	1,014
Belgium . .	7,238,622 (Est. 1906)	7,139	1,014
Netherlands .	5,672,237 (Cen. 1906)	5,435	1,044
United Kingdom . . .	44,100,231 (Est. 1906)	41,305 (Excl. 22,159 "Evening Students")	1,068
Spain . . .	18,831,574 (Cen. 1900)	15,642	1,204
Roumania . .	6,585,534 (Est. 1907)	5,336	1,234
Sweden . . .	5,337,055 (Cen. 1906)	4,032	1,324
Portugal . .	5,423,132 (Cen. 1900)	3,923	1,382
Norway . .	2,321,088 (Est. 1906)	1,500	1,547
Servia . . .	2,676,989 (Est. 1904)	1,022	2,619
Russian Empire . . .	149,299,300 (Est. 1906)	54,208	2,754
Bulgaria . .	4,035,623 (Cen. 1905)	1,324	3,048

Note. Population from *Statesman's Year Book*, 1908.
Number of Students from *Report of U. S. Commissioner of Education*, 1908, Vol. I.

To analyze the forces underlying this great wave of emancipation remains a problem for the future historian. Here it must be sufficient to note the phenomenon and pass on to some of its effects. It is also to be noted in passing that going side by side with the great increase in numbers there has been a vast improvement in the standards of the educational institutions as affecting both their entrance requirements and their own grade of work. Whether as cause or effect, there has also accompanied this wonderful growth a remarkable broadening of curriculum and quite a complete change of emphasis on what constitute the essential factors of higher training. Fundamentally this movement measures the success of the pressure insisting that the higher educational curriculum and opportunities conform to the social needs of the times.

TABLE II

RATIOS OF ATTENDANCE OF VARIOUS COURSES AT THE GERMAN UNIVERSITIES, TECHNICAL AND PROFESSIONAL COLLEGES

FACULTY	1830	1869	1905	RATIO $\frac{1869}{1830}$	RATIO $\frac{1905}{1869}$
Universities					
Theology . . .	6,076	2,986	3,846	0.49	1.29
Law and Finance	4,502	3,178	12,456	0.71	3.92
Medicine (including Dentistry)	2,355	3,140	6,142	1.33	1.96
Philosophy (incl. Philology, Mathematics and Science) . .	2,937	4,853	19,494	1.65	4.03
Polytechnica					
Architecture and Civil Engineering[1]		942	5,443		5.75
Mechanical and Electrical Engineering[1] . .		241	5,161		21.50
Chemical Technology . . .		213	1,431		6.70
Special Branches		418	1,577		3.77
Professional Colleges					
Mining . . .		144	686 [835 incl. hearers]		4.77
Forestry . . .		306	309 [366 incl. hearers]		1.01
Agriculture . .		357	1,517 [1,698 incl. hearers]		4.25
Veterinary Medicine		267	1,120 [1,260 incl. hearers]		4.20
Commercial Universities . .			1,076 [3,098 incl. hearers]		

Unless otherwise stated, the numbers are for matriculated students only. The ratios are for matriculates.
Population: 1869, 40,805,000; 1905, 60,641,278. Ratio: 1905 :1869, 1.5.

It is of interest to compare this vast and increasing throng of students to a powerful stream which, refusing longer to be confined within narrow, artificial banks, has burst through and found its own natural channels. What these have been can be seen from the foregoing table (II) comparing the German student attendance in the various channels of work for the years 1869 and 1905.

It is folly to dream of checking this mighty stream or of turning it back into the banks of a narrow scholasticism. The problem is to provide adequate and suitable channels for it. Conditions are rapidly changing, and educators must face the facts as they are.

The profound demand of this army of nearly three hundred thousand students in the United States to-day is for an education which will enable them to live most worthily and effectively the life of to-day and to-morrow. The demand, which will not be denied, is for breadth of culture coupled with an effective bearing upon the needs and problems of life — a culture whose keynote shall be efficiency in action and service.

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[1] Original data not segregated.

The problem of the educator is that of the correct interpretation and guidance of the social need.

The following table (III), comparing American and German attendance, also throws light upon this phase of the subject.

TABLE III

COMPARISON OF ATTENDANCE OF VARIOUS COURSES IN GERMANY AND THE UNITED STATES, 1905–1906

	UNITED STATES	GERMANY	RATIO $\frac{U.S.}{G.}$
Population . . .	83,935,000	60,641,278	1.39
Theology . . .	7,968	3,846	2.07
Law	15,411	12,456	1.22
Medicine . . .	24,924	6,142	4.05
(Incl. Dent. and Pharmacy) . .	36,945		[6.01]
Philosophy or Liberal Arts .	94,200[2]	19,494	4.83
Arch. and Civ. Engineering[1] . .	10,200[2]	5,443[3]	1.86
Mechanical and Electrical Engineering[1] . .	15,150[2]	5,161	2.95
Chemical Technology . . .	1,420[2]	1,431	1.00
Mining	3,260[2]	686	4.75
Agriculture . . .	5,000[2]	1,517	3.3
Veterinary Medicine	1,445	1,120	1.29

Data from Ascherson, Lexis, *Minerva*, and *Report of U. S. Commissioner of Education*, 1906.

In making this comparison, too definite conclusions must not be drawn, as there are marked differences in standards and curricula. Thus it is probable that quite one half of the American collegiate students are doing work of German gymnasial grade. In the technical and professional fields it is possible that the work is more nearly commensurate. Another item not indicated here is the much larger proportion of women students in the United States. However, this broad subject of comparison can only be touched upon and left with the statement that American standards are improving more rapidly than they are aware who have not been giving attention to the subject.

In both Germany and the United States, indications have not been lacking that the increase in attendance is shifting in direction. In Germany the Polytechnica do not appear to show a growth in recent years proportionate to that of the universities. For the year 1909–1910, only one American university (Stanford) shows any marked gain of engineering students over the preceding year. Other professional fields, noticeably medicine, appear to show a similar check. On the other hand, the Commercial High Schools of Germany and the American departments of Commerce and Diplomacy show very significant beginnings.

The most recent statistics regarding the trend of university attendance in France are given in Table IV.

TABLE IV

DISTRIBUTION OF FRENCH STATE UNIVERSITY STUDENTS BY FACULTIES FOR SPECIFIED YEARS (FROM *Report of U. S. Commissioner of Education*, 1909, VOL. I).

FACULTIES	STUDENTS		
	1907[1]	1908[2]	1909[3]
Law	15,551	16,315	17,046
Medicine	6,599	7,220	7,333
Sciences	6,349	6,258	6,408
Letters	5,710	6,201	6,216
Pharmacy	1,735	1,574	1,510
Extra University Schools of Medicine and Pharmacy .	2,253	2,322	3,384
TOTAL	38,197	39,890	41,897

Passing from the general aspect of the problem to certain effects brought in its train, it is significant to note the results wrought upon individual American institutions. For the purposes of this investigation five typical universities were selected. Geographically they form a chain across the continent, and in type they represent institutions resting upon private foundations, public foundations, and combined public and private foundations. They are Harvard, Cornell, Wisconsin, California, and Stanford. Charts of the numbers of regular students at each of these institutions, year by year, were plotted. The chart of attendance at Cornell is here given as being typical of all.

It is interesting to remark that each one of these institutions which was established before 1885 shows the same general trend of increase, as is shown by Curve B of Chart II, the curve of combined attendance at all higher American institutions of learning. Slight irregularities, due to local conditions, such as change of entrance requirements, etc., are, to be sure, to be observed. In common with Curve B they show the effect of the hard times following 1873 and 1893 in the form of a decided offset or sag. A similar effect may be expected in the years following 1907. It will be noted that the effect is a delayed rather than immediate one. Each chart shows a practically uniform attendance until about 1885, and then a sharp upward bend maintained with essential uniformity. It is remarkable that institutions differing widely in their nature and separated by thousands of miles geographically should experience simultaneously this thrill of rebirth. Who shall maintain that the growth of any single institution, beginning at this time, was due to the direct action or influence of some particular individual or administration? This simultaneous action indicates a much more profound cause than this — an institution not to have been affected by this broad, fundamental movement must have definitely turned its back upon the demand of the times and refused to open its gates to an awakening people.

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[1] Not segregated in German data. In United States, 900 Arch., 9300 C. E. and 2700 General Eng.

[2] Computed on basis of returns for 86.5 per cent of total. See *Report of U. S. Commissioner of Education*, 1906, p. 446.

[3] In 1902 there were 1995 Arch. and 2852 C. E. On a proportionate division this gives in 1905–1906, 2220 Arch. and 3223 C. E.

[1] *Report on the Budget.* — Service of Public Instruction, 1908, by M. Maurice-Faure, p. 25.

[2] The same, 1909, by M. Maurice-Faure, p. 79.

[3] *Bulletin Administratif*, 1909, No. 1868, p. 503.

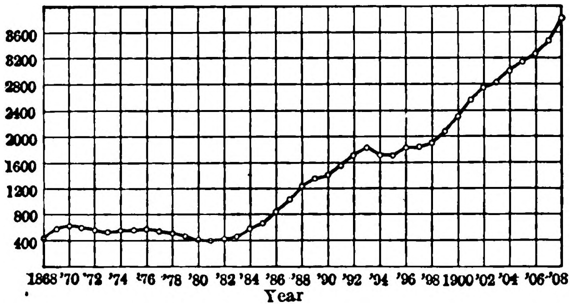


Chart of regular students in attendance at Ithaca (exclusive of summer school, short courses, and the College of Medicine in New York).

Aside from its effect upon the curricula of the institutions, a subject worthy of careful study, this rapid growth has wrought profound changes upon the nature and composition of the teaching staffs. G. H. M.

See College Graduates, Professional Distribution of; University Graduates, Professional Distribution of.

COLLEGE AND UNIVERSITY, COST OF INSTRUCTION IN.— See University and College, Cost of Instruction in.

COLLEGE AND UNIVERSITY PHILANTHROPY.— See Philanthropy, Educational.

COLLEGE AND UNIVERSITY PROPERTY. — No accurate study up to the present time has been made of the values of the sites owned by colleges and universities, or of the equipment used for educational purposes, such as laboratory supplies, furniture, and apparatus. The data collected on this subject by the United States Bureau of Education and by other agencies do not form a basis for such a study. Figures for the values of these assets may be obtained from practically all educational institutions, but these figures as given are not comparable with any fair degree of accuracy. Reasons for this status may be briefly stated. First, with regard to the land used for building sites, campuses, and athletic parks: such real estate is not a business asset in the same sense as real estate held as investment. It is not productive of income. College treasurers have, therefore, not usually included the value of the educational plant, with additions and depreciations, in the balance sheet; they have given these items in a separate exhibit, and have set down nominal rather than scientifically computed values. The explanation for this method is that in years past the purpose of college accounting has been historical rather than to assist in securing costs and in governing financial policy. Whether the plant was overvalued or undervalued was not significant. In some instances the stated value of such plants has not been changed in fifty years, though in the meantime a city has developed about the campus and the adjoining real estate increased many hundred per cent.

There is a marked tendency at this time for colleges and universities to adopt methods of accounts such as are now in use in our most highly developed business enterprises. As this conception comes into practice an earnest effort is being made to place true values on all tangible assets; with broad limits to change these values as conditions change, and to utilize all of these figures in estimating the cost of education and in adjusting educational policies. If, in the end, this plan is to succeed and we are to have values which are comparable, colleges and universities will need first of all to adopt certain definite bases of judgment which are practically permanent in nature. Such an effort is still in its first stages, but it seems to be proceeding along the following lines: (1) It is not considered a requisite of good accounting to change the figures of a piece of property every time the market seems to change, but it is important that these changes be made periodically, preferably at stated intervals of from one year to three or five years. Unless an effort is made to do this at given periods, revaluations are apt to occur only when imperative; they are left to chance. (2) In the matter of lands, college property seems to be divided into three general classes:

(*a*) Land, the value of which can be definitely determined from the values of surrounding property, irrespective of the existence of the college. Thus, the value of the site of Columbia University may be determined by the prevailing realty values of New York City property in its immediate vicinity. The influence of the college upon the value of the surrounding land is slight. (*b*) Land, the value of which is dependent both upon city realty value, irrespective of the existence of the college, and upon the influence which the college itself exerts upon the immediate land values. Thus, the land occupied by Harvard is desirable property as a residential district of easy access to Boston. But the existence of Harvard in Cambridge also probably holds Cambridge real estate at a higher cost than if Harvard were not there. (*c*) Land, the value of which is dependent chiefly upon the existence of the college itself. Princeton University and Hampden-Sidney are types of this class. If either of these institutions were removed, its site would be valuable only as village property or as farm land. These variables cannot, of course, be sharply differentiated. They may prove helpful in determining a purchase price which should replace in accounting the original values fixed in some instances many years ago, or the nominal values as given frequently in other instances. It goes without saying that, if property is purchased in the open market, the purchase price should be considered the inventory value until changed conditions necessitate a revaluation. (3) The point of view should be the market value of the land with the supposition that the buildings are to be removed. (4) In inventorying buildings, replacement values should be used. The value of each building should be stated independently of a group of buildings.

According to the best available data, the value of college property among institutions which merit places of first rank ranges from about $200,000 to about $16,000,000. The property used for educational purposes of Franklin College is estimated at $250,000; Washington and Lee University at $360,000; Grinnell College at $511,000; Beloit College at $627,000; University of Minnesota at $3,385,000; Columbia University (exclusive of Barnard College, Teachers College, and the College of Pharmacy) at $15,581,000. The United States Commissioner of Education in 1907 collected data concerning property owned by state institutions. A scrutiny of the figures of this report reveal the fact that, however rough the estimates may have been, the basis of judgment as to the values must have varied widely. J. G. B.

Reference: —

Carnegie Foundation for the Advancement of Teaching, Bull. No. 3. *Standard Forms for Financial Reports of Colleges, Universities, and Technical Schools.* (New York, 1910.)

COLLEGE AND UNIVERSITY PROPERTY, TAXATION OF. — See Taxation of Property of College and University.

COLLEGE AND UNIVERSITY, SELF-GOVERNMENT IN. — See Self-Government in College and School.

COLLEGE AND UNIVERSITY, STUDENT LIFE IN. — See Student Life in College and University.

COLLEGE ATHLETICS. — See Athletics.

COLLEGE BOARDS IN EDUCATION, DENOMINATIONAL. — State supervision of higher education in the United States, except in the state of New York, has been confined to tax-supported institutions. Without a conscious relation to the general system of education, a general multiplication of colleges has occurred and the exigencies of this situation are in part responsible for the creation of various denominational boards of education.

Before entering upon a description of the organization and work of these boards, it is worth while to state briefly the influences which have hitherto operated in bringing colleges into related groups, the connecting thread being a denominational one. The earliest educational foundations in the United States were established under the supervision of Christian churches. Thus, the relation between Harvard College and the established Congregational churches of the Colony of Massachusetts Bay was a close one, the ministers of certain towns long retaining seats upon the board of overseers. Similarly, Yale College was in direct relationship with the Congregational churches of Connecticut, the charter retaining for over one hundred years a provision for a certain number of Congregational divines as trustees; and when, during the middle of the eighteenth century, the president of Yale and several professors announced their intention to enter the Church of England, the announcement was, as a matter of course, accompanied by their resignation from the college faculty. King's College in New York City (now Columbia University) was established under the auspices of the Church of England, the Archbishop of Canterbury being the Visitor of the college, and Trinity Parish in New York providing the college with its first site. The Venerable Society for the Propagation of the Gospel occupied, until the Revolution, the position of patron of King's College, and assisted it frequently with funds. Princeton, notwithstanding an absence of charter control, is generally considered as distinctively a Presbyterian college as Rutgers was a Dutch Reformed; and in general it may be said that until well along in the nineteenth century, whether colleges were legally connected with a church or simply associated with a church in thought and service, almost every educational institution looked up to some one of the churches for fostering care and means of growth, and in return gave to that church the influence to be derived from the regulation of the form of worship in the college chapel and from the free use of the college pulpit. It may be remarked that the sundering of the legal charter ties in the cases of Harvard, Yale, and Columbia did not prevent those institutions from remaining in this relation of community of worship with the church by which they had formerly been controlled. It was not usual for a college to be established, like Leland Stanford Junior University, hospitable and receptive to all of the religious bodies to which its students belong, but on especially intimate terms with none. The extraordinary charter requirements of Girard College (*q.v.*) show how, in the period of its incorporation, it was thought almost necessary to accompany freedom from any form of ecclesiastical control with the denial of ordinary courtesies to ecclesiastics.

In the Roman Catholic institutions the connection with the church is as a rule maintained through the ownership of the entire property of the college or university by one of the religious orders. Thus the first Roman Catholic college in the United States was founded by the Jesuit Fathers when they secured a charter for Georgetown University; and at the present time this order and some of the other orders, particularly the Christian Brothers (*q.v.*), control a number of educational institutions, scattered over many states. It was not until 1899 that all of the Roman Catholic colleges were brought into intimate relationship with each other through the formation, by 53 colleges, under the guidance of the rector of the Catholic University of America, of an Association of Catholic Colleges of the United States (*q.v.*). The close union between the colleges of a Roman Catholic order is thus the first illustration of what has been for a considerable time the policy in several Protestant churches through their educational societies or college boards. The Association of Catholic Colleges in the United States is, on the other hand, rather a federation corresponding to the Ohio State Association of Colleges, or the Association of Colleges of the Middle States and Maryland, for it concerns itself with pedagogical questions and matters of intercollege comity more than with policies of college administration and economy. Partly out of the lack of unity among colleges of the same denomination grew the idea of a central board, which might have supervision, at least of a certain sort, over all the colleges and schools of a given denomination. Of these the more important are the Presbyterian College Board, the Board of Education of the Methodist Episcopal Church, the Board of Education of the Methodist Episcopal Church, South, the Congregational Education Society, and the Board of Education of the Reformed Church in America, of whose organization and educational policy brief descriptions follow.

Presbyterian College Board. — Organized in 1883 by the General Assembly of the Presbyterian Church in the United States of America, under the name of the Presbyterian Board of Aid for Colleges and Academies. In defining the purposes of this organization special emphasis was placed upon the wisdom of establishing colleges in sparsely settled and rapidly growing western states. This policy was to assist the missionary movement by training up the ministers and missionaries on the ground. The board as now constituted consists of 24 members, one half of whom shall be laymen, both ministers and laymen to be elected by the General Assembly. The principles under which the board will either aid colleges directly or endeavor to influence gifts to them are: (1) The college must require of all students before graduation a study of the Bible at least equivalent during the entire course to 144 hours. (2) Every teacher in the college must be certified to the board as being of open Christian profession and possessing actual spiritual influence with students. (3) A college assisted or endowed by the board shall seek the conversion and the consecration of every student as its prime business. Coöperating with the board at this time are 51 colleges. The offices are at 156 Fifth Avenue, New York City.

Board of Education of the Methodist Episcopal Church. — Organized by a committee of the General Conference of 1864 to consider the disposition of moneys raised as educational funds. The board began its work with a fund of $84,000, six sevenths of which had been contributed as a part of the Sunday School Children's Fund. In 1892 the General Conference made it the duty of every pastor to take an annual collection in his church for the fund and to forward it to the Board of Education. The money thus collected was to be used by the board for the relief of poor scholars and for the development of general educational interests. In this year, also, the Board of Education was ordered by the General Conference to apply certain regulations of the University Senate of the Conference in regard to college standards. The University Senate consists of 15 members, all of whom are presidents or heads of Methodist colleges or universities. The following resolution is significant of the work of the board: That while the University Senate is not yet ready to prescribe as an immediate requirement a measurably higher standard for the colleges on the official list, it is deemed best to advise all our institutions to move as speedily as possible to the following standard: (1) To the requirement of a full four-year preparatory course for entrance to the freshman class. (2) To the requirements of full four years of collegiate work as leading to the bachelor's degree — the course to include only such studies as properly belong in the college of liberal arts. (3) To the requirement of a faculty of not less than six professors, giving their time exclusively to collegiate as distinguished from preparatory work. (4) To the requirement of not less than 50 students regularly enrolled in the four college classes. (5) To the requirement of not less than $200,000 as actual productive endowment as necessary to give an institution stability and to secure for it the confidence of its constituency.

Board of Education of the Methodist Episcopal Church, South. — Organized by the General Conference which met in Memphis, Tenn., in the spring of 1894. The aim of the board is, first, to promote the endowment of existing colleges which have the elements of success and the necessary conditions of usefulness; second, to repress the tendency to multiply institutions with inadequate prospects of support; third, to encourage the establishment of academies which " are especially demanded by present educational conditions, and are easily within the reach of our means and should be placed in close correlation with such institutions of our church as the annual conference may direct." The fourth and final aim of the board was announced to be " to complete our system by correlating as rapidly as possible our conference colleges with the graduate and professional departments of Vanderbilt University." At the meeting of the board in 1896 steps were taken for securing complete statistics of the educational institutions of the Methodist Episcopal Church, South. A committee was also appointed "to report on the possibility of bringing about a uniform standard in our institutions and of correlating them." At the 1897 meeting special attention was given to the work of the teachers' bureau under the management of the board, and the secretary of the board was authorized to publish an educational quarterly. In 1898 the directors at their meeting paid much attention to education among the negroes under their supervision. In the last five years a number of important pieces of work have engaged the attention of the Board of Education. One of these has been the question of the classification of the educational institutions of the Methodist Episcopal Church, South, for which purpose the board now has a permanent committee. In 1907 the educational commission made a careful and comprehensive report on that subject, which has been adopted by the board. This report classifies the educational institutions of the church into three grades. The first is that of universities; and a university is defined as an institution having " a productive endowment of not less than a million dollars, and organized on a basis of professional schools and of elective studies, with departments of original research." Colleges constitute the second grade; and " in order to be classed as a college an institution must employ not less than seven professors, or adjunct professors, giving their entire time (at least fifteen hours a week) to college instruction. It shall have, exclusive of matriculation and tuition fees, a permanent annual income of five thousand dollars, which may arise from interest on endowment fund, conference assessments, private gifts, or net earnings from board or dormitories." There are two classes of colleges, Class A and Class B. In order to be admitted to Class A, a college must have an endowment fund (unless it is a college for women) of $100,000, and since 1909–1910 must require 14 units for admission.

Congregational Educational Society. — On Dec. 4, 1816, there was incorporated in the city of Boston the American Society for the Education of Pious Youth for the Gospel Ministry. This organization was the result of a movement set on foot about six months before that date by a few young men who banded themselves together " to educate pious young men for the ministry." The opening meeting of the society was held Dec. 7, 1816. On the occasion of this meeting need of trained ministers in the West and South was set forth. Within eleven months $4000 were collected from the churches, and 40 young men " of hopeful piety " in Canada and the United States were being aided financially in their education. Three years later, on Jan. 31, 1820, the name of the society was changed to the American Education Society (*q.v.*). In the West a somewhat similar movement had been started, out of which grew the founding of Illinois College in Jacksonville. The new society, called the Western College Society, had no strong organization. It was not until June 29, 1843, that this society was formally launched as the Society for the Promotion of Collegiate and Theological Education. On Mar. 9, 1874, this second organization was united with the Boston society under the new name of the American College and Education Society. Until 1893 the work of the American College and Education Society was confined to collegiate and seminary education; but by an act of legislature of Mar. 25, 1893, its scope was enlarged to include preparatory training, and its name was changed to the American Education Society (*q.v.*). The need for academies which should give good college preparatory courses was felt in the West and Southwest, where secondary education was especially weak, and within three years the society was aiding " a score of academies from twelve different states and territories." In September of the same year the society consolidated with the New West Education Commission, an organization incorporated in Chicago in 1879, whose object was " the promotion of Christian civilization in Utah and New Mexico . . . through the agency of Christian schools." The consolidation added mission school work to the already large scope of the society. On Mar. 9, 1894, the name of the society was again changed, this time to the Congregational Education Society, the title which it bears to-day. Its object, as finally set forth in the constitution adopted Apr. 11, 1904, is " the promotion of Christian Education by assisting needy young men of piety and ability in acquiring an education for the gospel ministry; by aiding collegiate and theological institutions, academies, and other schools in which children and youth are trained under Christian teachers." By an act of legislature approved Feb. 25, 1907, and adopted by the corporation June 12, 1907, the powers of the society were enlarged by the authority " to promote Christian civilization in any territory or country acquired or hereafter acquired by the United States . . . and in foreign countries, by endowing, assisting, or establishing academic, collegiate, or theological institutions of learning therein, and by . . . aiding indigent children and young persons . . . seeking an education in such institutions." Up to 1906 the society had made large contributions in all branches of its work. More than $2,457,113 had been given to 30 colleges and seminaries in the ninety years of its existence — an average of over $27,300 a year; $354,424 had been donated, within fourteen years, to academies, making here an annual average of $25,316; $887,964 had been contributed toward the mission schools since the beginning of the New West Education Commission. According to a statement published in 1906 by the society itself, the total for all its departments from their respective beginnings until that year was $5,541,209.

Board of Education of the Reformed Church in America. — In 1812 the General Synod of the Reformed Church in America ordered that collections be taken up in the churches for the sustenance of needy students for the ministry. The copyright of the *Psalm and Hymn Book* was also secured to the synod for this purpose, and several bequests were received from members of the church. But the sum available continued small, and in 1828 a number of ministers and other friends of education met in the lecture room of the Collegiate Church in New York City, to consider the propriety of organizing a board of education. As a result of this meeting a board of education was organized, with Colonel Henry Rutgers as president. The amount granted to a beneficiary was at first limited to $90 a year, being designed to aid a student rather than sustain him fully. During the first year of its operation the board, with its auxiliary societies, assisted about twenty students. In 1831 this education society, to which donations began to be left, requested the general synod to take charge of it as the synod's own board. Accordingly, in 1832, the synod constituted a new board, with the same officers as the former board, and the funds of the old board were turned over to the care of the synod. The board was incorporated in 1869, and since then it has retained in its own hands the scholarship funds entrusted to its care. These now amount to $127,000. Before the organization of the board as a corporation the funds collected for this purpose were held either by the general synod itself or by Rutgers College. The total amount of the several funds is now about $400,000.

COLLÈGE BOURGET, RIGAUD DE VAUREUIL, QUEBEC. — A school for boys founded in 1850 and conducted by the Clerks of Saint-Viateur. Preparatory, classical, and commercial departments are maintained. There is a faculty of 15 professors in the classical department.

COLLEGE, CERTIFICATE SYSTEM OF ADMISSION TO. — See ACCREDITED SCHOOLS; COLLEGE REQUIREMENTS FOR ADMISSION; COLLEGE EXAMINATION AND CERTIFICATION BOARDS; HIGH SCHOOL AND COLLEGE, PLACE OF.

COLLEGE, COEDUCATION IN. — See COEDUCATION; WOMEN, HIGHER EDUCATION OF.

COLLEGE CURRICULUM, ADMINISTRATION OF AND TYPES OF. — See COLLEGE, AMERICAN, p. 66, seq.

COLLEGE DEGREES. — See DEGREES.

COLLEGE DISCIPLINE. — See STUDENT LIFE; COLLEGE, AMERICAN.

COLLEGE, ENGLISH. — The distinction between those colleges which only offer secondary school work and those which give courses leading to university degrees is so well marked in England that it is not necessary to give separate treatment to those institutions which bear that title. In the article on COLLEGE it has been pointed out that many schools which call themselves colleges have no right to that title, but have adopted it in imitation of the older and more famous institutions such as Eton College (*q.v.*), Winchester College (*q.v.*), etc. Representative lists of colleges of secondary school grade will be found under GRAMMAR SCHOOLS, ENGLISH; see also, ENGLAND, EDUCATION IN; PUBLIC SCHOOLS. Those Colleges which are constituent parts of the universities are given under CAMBRIDGE UNIVERSITY; LONDON, UNIVERSITY OF; IRELAND, NATIONAL UNIVERSITY OF; OXFORD UNIVERSITY.

COLLEGE ENTRANCE REQUIREMENTS. — See COLLEGE REQUIREMENTS FOR ADMISSION.

COLLEGE EXAMINATION AND CERTIFICATION BOARDS. — During the past thirty years various associations of colleges and of preparatory schools have been formed for the purpose of perfecting the relation between the high school and the college. These organizations have sought to establish (1) a fair degree of flexibility in high school curricula and in college entrance requirements; (2) uniformity in the standards of high schools and in the requirements of the colleges; (3) adequate and uniform administration of policies agreed upon. With these common interests, small groups of college and high school teachers have united for the betterment of local conditions. Progress along these lines from a national point of view is of comparatively recent date. The first notable effort toward a uniform standard in college requirements grew out of a conference of New England colleges held at Trinity College, in December, 1879. At the conference a comparison was made of college catalogues and of college examination papers. President Eliot describes the finding in his *Report* for 1886–1887, page 5: "Some colleges demanded no English at entrance; others required the candidate to write a short composition, but gave no hint as to what the subject might be; others called for a knowledge of formal grammar and nothing else; others for both grammar and composition. Some of the examination papers asked questions which could not be fully answered without a minute knowledge of prescribed texts, or of difficult points in grammar; others asked questions suited to the capacity of grammar school, or even primary school, pupils." This conference led to the adoption by the New England colleges, with the exception of Yale, of a uniform requirement in English. The English requirements which were then in force at Harvard were accepted. In the next three years a similar uniformity in stated requirements for the classics and for mathematics was accomplished for New England. The fair degree of uniformity thus put into practice stimulated the formation of permanent organizations of secondary schools and colleges. At the meeting of the Massachusetts Classical and High School Teachers' Association in 1884, the secretary of the association was requested by vote to propose to the heads of the New England colleges a conference with preparatory school teachers. Out of this effort grew the first organization of the kind, the New England Association of Colleges and Preparatory Schools. The object of the association was stated to " be the advancement of the cause of liberal education by the promotion of interests common to colleges and preparatory schools." The membership of the association was open to all colleges and preparatory schools within the territory, irrespective of educational standard or number of courses. Seventy-three colleges and preparatory schools are enrolled as members.

In 1887 representatives of 15 colleges in the state of Pennsylvania met at Franklin and Marshall College, and formed themselves into an association to be called the College Association of Pennsylvania. The next year the scope of the association was extended and the name changed to the Association of Colleges and Preparatory Schools in the Middle States and Maryland. The object, among other things, has been from the first " to consider the qualification for candidates for admission to the colleges and the methods of admission." Any college, normal school, or other school preparing students for college may be received into membership.

The Association of Colleges and Preparatory Schools of the Southern states was organized in the autumn of 1895 at Atlanta, Ga., at a meeting of delegates from a number of southern colleges and universities. The purpose of the meeting as stated was, first, to organize southern schools and colleges for coöperation and mutual benefit; second, to elevate the standard of scholarship and to effect uniformity of entrance requirements; and, third, to develop preparatory schools and cut off this work from the colleges. This association has taken definite steps toward promoting uniform standards of entrance; and regulations touching upon the amount of work to be required and the administration of these requirements are made conditions for membership in the association. The roll of members of the association includes 19 colleges and universities, and 30 schools.

The North Central Association of Colleges and Secondary Schools was organized in 1892 for the purpose of establishing closer relations between the colleges and secondary schools of the North Central states. The membership of the association comprises, first, colleges, universities, and secondary schools; second, individuals identified with educational work within the limits of the association. No college or university is eligible for membership whose requirements for admission represent less than 15 units of secondary work, nor which confers the degree of Doctor of Philosophy or Doctor of Science except after a period of three years of graduate study, not less than two of which must be years of resident study, at least one year of resident study to be spent at the institution conferring the degree. This association includes Ohio, Michigan, Indiana, Illinois, Wisconsin, Iowa, Missouri, Nebraska, Kansas, Colorado, and Oklahoma.

The associations just described have been the important organizations of a local nature whose chief object has been promotion of better understanding and coöperation between secondary schools and colleges. In addition to these organizations, there are a number of state college associations which exist primarily to safeguard the standards of higher education. They are in reality protective associations against sham colleges. Such organizations are especially active in Ohio and Missouri. In the state of Iowa there exists an exceptional plan for the regulation of collegiate instruction which may be compared with the University of the State of New York. The General Assembly created a board of educational examiners, composed of the State Superintendent of Instruction, the president of the state university, the president of the state normal school, and two men appointed by the Governor. This board under the power vested in it has grouped the colleges of the state into three classes. A system of " points " is defined and the colleges are divided according to the number of points that they are able to meet. The points and the methods of grouping the colleges are as follows: —

> (1) The number of class hours for the heads of departments and students shall not exceed twenty a week. (2) A faculty properly qualified shall consist of graduates of colleges who have pursued graduate work equivalent at least to that required for a master's degree. (3) The library shall consist of at least five thousand volumes, selected with reference to college subjects and exclusive of public documents. (4) The laboratory equipment shall be worth not less than $5000 and so distributed as to establish at least an efficient chemical, physical, botanical, and zoölogical laboratory. (5) The means of support is defined as requiring a permanent endowment of not less than $200,000 or a fixed assured income equivalent to the interest derived from at least $200,000. (6) The average salary of heads of departments, exclusive of the salary of the president, shall be at least $1000.

(7) The college must maintain at least seven separate departments or chairs, and in case the pedagogical work of the institution is to be accepted without examination, the college must maintain at least eight chairs, one of which shall be devoted exclusively to education or at most to philosophy, including psychology and education. The heads of these departments should be devoted to college work. (8) The graduates must show the completion of a four-year secondary course and a four-year college course above the usual eight grades of common schools, and the standing and character of the institution and the nature of its equipment and work must be such as to entitle its graduates to admission to the graduate college of the State University of Iowa.

In the state of New York the degree-granting power of colleges and universities is under the control of the Regents of the University of the State of New York (*q.v.*). This board has outlined a system of "counts," and institutions of higher learning in the state must require for admission 70 counts if they are to grant college degrees. In other words, by legislative power the colleges and universities of New York are based upon a four-year high school system.

All of the associations just enumerated have exerted an important influence in their respective territories toward uniformity and toward sincerity in college work. Each association has restricted its membership on geographical lines; and each has developed with little reference to educational conditions outside of its own boundaries. The combined efforts of these movements, however, have prepared the way for a national adaptation of certain practices which they have encouraged or demanded. Such a development, inevitable in view of the many local forces at work on the same problems, found its first expression in the report of the Committee of Ten which was appointed by the National Educational Association in 1892. This committee was appointed to formulate plans looking to a greater degree of uniformity in admission requirements. In approaching the problem the committee turned its attention to the details of the courses of secondary schools, and its report gave a tremendous impetus toward uniform secondary education. It was the sense of the committee that the colleges should adapt their requirements to the secondary schools after these schools had been put upon a sound educational basis. With uniformity in the secondary schools, uniformity in college entrance requirements would follow as a natural sequence. The methods of adjustment between the colleges and secondary schools were left for each college or association of colleges to solve.

In 1895 the Committee on College Entrance Requirements was appointed by the National Education Association to investigate existing entrance conditions and to report upon ways and means of securing uniformity. The final report of this committee, which was in preparation for four years, was presented in 1899. The conclusions rising out of the investigation were set forth in fourteen resolutions. These resolutions furnished a feasible means of securing uniformity as well as elasticity in the requirements. The report was the first step, national in character, toward bringing the high schools and colleges throughout the country into harmonious coöperation.

The practical administration of uniform entrance regulations, even after such regulations had been adopted, was still to be accomplished, and in a large measure is still to be accomplished. Uniformity in theory without uniformity in practice not only leaves the problem unsolved, but is one of the chief causes of the separation of our educational system into unrelated parts. More than any other one thing it has given rise to a lack of confidence in the colleges among high school teachers. Different interpretations of a uniform requirement may each be made with sincerity; but from the point of view of the secondary school the fairness and the sincerity are not always evident. The difference in interpretation is frequently so great that the requirements, uniform in theory, are in practice radically unlike. The desire that the various educational associations should consider their problems national rather than sectional resulted in the formation in 1906 of the National Conference Committee on Standards of Colleges and Secondary Schools. This committee is a means by which each association represented in it keeps in touch with the problems and progress of the various associations. The committee is composed of delegates from the following organizations: —

The New England Association of Colleges and Preparatory Schools.
The New England College Entrance Certificate Board.
The Association of Colleges and Preparatory Schools of the Middle States and Maryland.
The College Entrance Examination Board.
The North Central Association of Colleges and Secondary Schools.
The Association of Colleges and Preparatory Schools of the Southern States.
The National Association of State Universities.
The Carnegie Foundation for the Advancement of Teaching.
The United States Commissioner of Education, *ex officio.*

The most effective agency working toward uniformity in administration of entrance requirements is the College Entrance Examination Board. This board not only publishes from time to time a statement of the ground which should be covered and of the aims which should be sought by secondary teaching, but it arranges for a uniform and impartial marking of all examination papers. The following subjects as taught in secondary schools come within the scope of the board: botany, chemistry, drawing, English, French, geography, German, Greek, history, Latin, mathematics, physics, Spanish, and zoölogy. The board has in the past seven years provided a means for a fair and trustworthy uniformity of entrance terms among the institutions which make up its membership. This membership extends west as far as Cleveland, and south as far as Baltimore.

Another organization which should be here included is the Association of Collegiate Alumnæ, formed in 1882 for " practical educational work." The association has 36 branches, with an enrollment of about 3800 members. These branches interest themselves in their local educational needs, such as the betterment of state legislation for education, and the closer coöperation between schools and libraries. But the main effort of the association has been to increase the desire among girls for college training, and to keep the educational standard of colleges for women on the same plane as that of the colleges for men. There are 24 colleges and universities whose non-professional degrees admit to membership.

In May, 1902, delegates from nine New England colleges met at Boston and organized the New England College Entrance Certificate Board. The purpose of the board, as stated, is " receiving, examining, and acting upon all applications of schools that should ask for the privilege of certification." The organization is an effort to perfect uniformity in accepting secondary school certificates, and differs in its purpose from the College Entrance Examination Board in that the one aims at uniformity in the accrediting plan, the other at uniformity by means of examinations. For discussion of the function of these Boards and work accomplished by them, see COLLEGE REQUIREMENTS FOR ADMISSION.

J. G. B.

COLLEGE FOR WOMEN, COLUMBIA, S.C. — A Presbyterian College for women. Collegiate, musical, fine arts, and commercial courses are given. The work of the college leading to the degrees of Bachelor of Arts and Bachelor of Science is based on approximately twelve points of high school work. The faculty includes 24 instructors.

COLLEGE GRADUATES, PROFESSIONAL DISTRIBUTION OF. — The constantly changing function of the American college in preparing students for professional work is well illustrated by the professional distribution of the graduates of Harvard College. (This article leaves out of consideration the professional schools of universities included in this discussion, and treats only the collegiate departments of those universities.)

Harvard. — The distribution for the collegiate department of Harvard is as follows.

Ministry. — The ministry during the early years of Harvard's history was the dominant profession. Not until Harvard had graduated students for a century did any other profession claim as many of its graduates; indeed, so great was this dominance that the institution during this time may with considerable propriety be considered a theological training school. The curve representing this profession has three distinct tendencies. (1) 1642–1720. During this period the tendency is slightly downward, but with wide variations. Seventy per cent of the graduates of the first three years entered the ministry, a percentage never again equaled in the history of the institution. During the later years of this first period, the central tendency of the curve is approximately 57 per cent. (2) 1720–1775. Here the downward tendency is much sharper, with a decline from 60 per cent to less than 20 per cent, and the variations during this period are much less marked. (3) 1775–1905. This period shows a long-continued persistent decline. In 1841–1845 the profession for the first time took less than 10 per cent of the graduates, but after 1850 no five-year period took more than 10 per cent. The average for the profession since 1875 is less than 5 per cent, and only 2.2 per cent of the graduates of the years 1901, 1902, 1904, and 1905, entered the ministry.

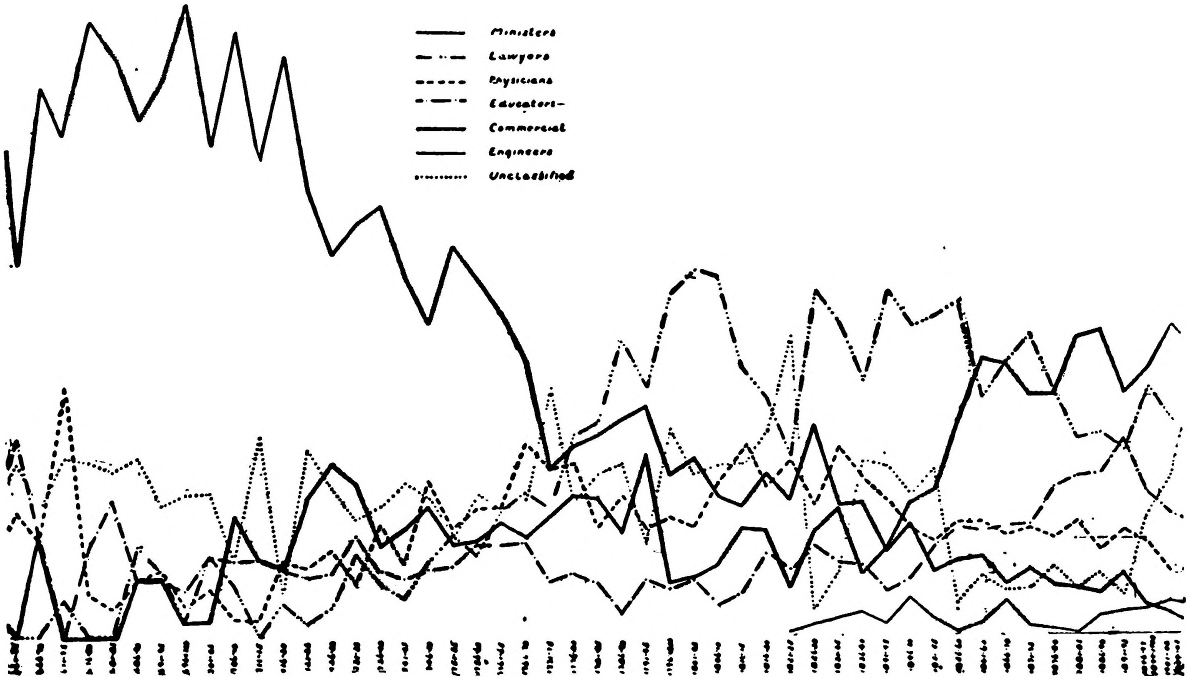
The following table, which gives the absolute rather than the relative numbers entering the profession, affords an additional viewpoint: —

YEARS	TOTAL NUMBER GRADUATES COLLEGIATE DEPARTMENT	TOTAL NUMBER MINISTERS
1651–1700 .	401	232
1701–1750 .	1184	527
1751–1800 .	1880	471
1801–1850 .	2834	411
1851–1900 .	9052	480

It will be noted that the ministry took more graduates between 1700 and 1750 than during any subsequent fifty-year period, although there has been an eightfold increase in the total number of graduates from the collegiate department. In other words, the profession has scarcely held its own in absolute numbers, while the total number of graduates has been increasing enormously. It is also true that the absolute numbers entering other professions has been increasing very rapidly. The remarkable decline in the ministry is further illustrated by the fact that the curve for this profession starts with a far higher percentage than that for any other profession, but is gradually outstripped by each of the leading professions in succession, and is at present the lowest of all.

Law. — The development of the legal profession at Harvard may well be described by dividing it into four periods. (1) 1642–1685. Practically nil. There were only two lawyers during the period. (2) 1685–1780. The percentage at no time exceeded 15 per cent. (3) 1780–1880. During this time law was the dominant profession at Harvard, and with some exceptions took approximately a third of the graduates. (4) 1880–1905. During this period a declining tendency is apparent, with an average percentage of 21.5 per cent. Law is exceeded by business pursuits.

Medicine. — During the first century the curve representing the profession of medicine is variable, reaching during this period both its maximum and minimum points. These are 25.9 per cent for 1671–1675 and 1.6 per cent for 1711–1715 respectively. Three five-year periods have a percentage greater than 10 per cent, and six five-year periods have a percentage less than five per cent. The next 100 years varies less and has a slightly higher average than either the preceding or the subsequent period. Eleven of the five-year periods have percentages between 10 and 15 per cent, and nine of them between 15 and 20 per cent. Since 1850 the central tendency for this profession has been about 11 per cent.

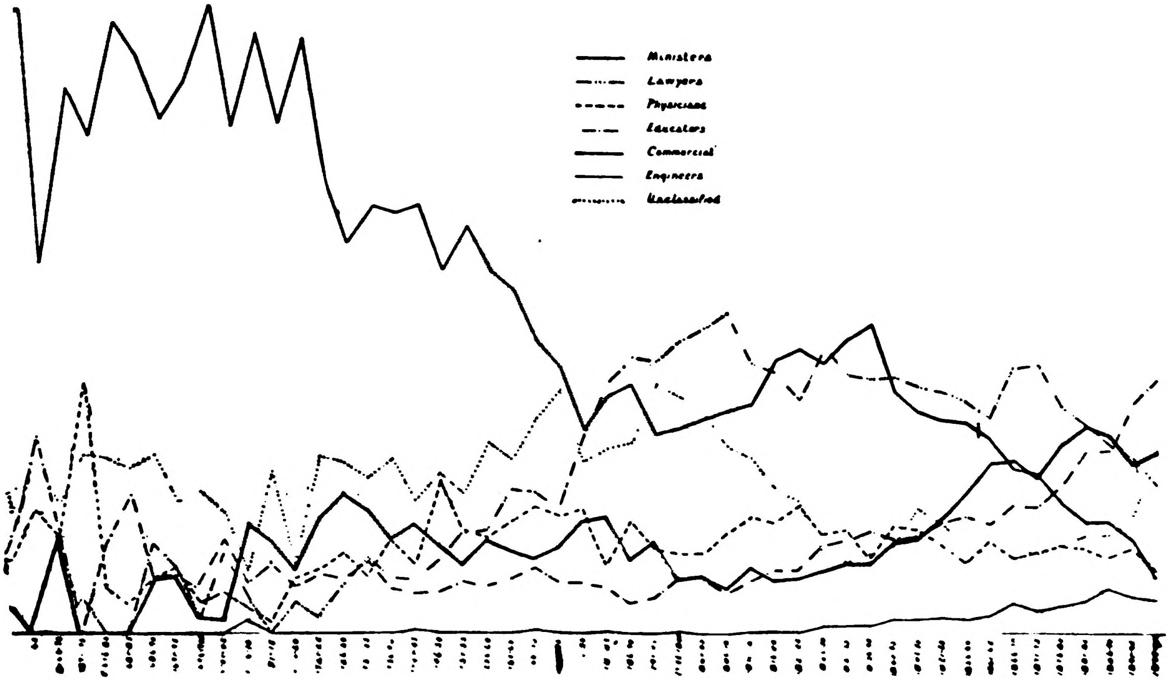


Professional Distribution of Graduates of Harvard College from 1642 to 1905.

Teaching. — Before 1685 the tendency for this profession is quite variable, with a central tendency of about nine per cent. For the next 165 years the central tendency (median) is 6.5 per cent, with only eight five-year groups out of the 33 included in this period varying from it by more than two per cent. After 1850 a rise is apparent which tends to increase toward the latter end of the century. Between 1850 and 1875 the average percentage is 10.9 per cent, while between 1875 and 1900 it is 16.8 per cent. The maximum for this half century, found in the period 1891–1895 is 20.4 per cent, or over one fifth of the graduates, and is greater than that of any other profession except that of commercial pursuits.

Commercial Pursuits. — This group had representatives in only six of the five-year periods before 1700, and for these the percentages are small. Between 1700 and 1850 the median for this group is 8.9 per cent, and two thirds of the periods vary from it by less than 3.5 per cent. The prominent periods during this 150 years are 1720 to 1735 and 1791 to 1795, and the periods with the most conspicuous depressions are 1710 to 1720 and 1795 to 1845. Since 1850 there has been a general upward tendency, reaching the maximum percentage of 32.3 per cent in 1901–1905. Since 1880 it has been the dominant profession. The financial depressions of 1837, 1873, and 1893 are indicated by declines in the curves for those periods.

Minor Professions. — Engineering has never attracted very many of Harvard's graduates, but since 1820 has taken at least a small percentage from each five-year period. This varies between $\frac{1}{10}$ of one per cent and 3.9 per cent, and presents no striking characteristics or tendencies. Agricultural pursuits have always taken a few graduates, and the group seems to be as large at the present time as ever. Many five-year periods previous to 1800 show no representative in this group. The periods having representatives vary between 3.7 per cent and $\frac{1}{10}$ of one per cent, with the exception of the first period, 1642–1645, which had one farmer out of a total of 14 graduates, or a percentage of five per cent. Literature and journalism have been represented in every five-year period since 1800, with a percentage varying from $\frac{6}{10}$ of one per cent to 5.3 per cent, with a slightly larger central tendency since 1870 than between 1800 and 1870. A small group is classified under "public service." This classification was used, however, only for those persons who could not be classified under some other profession, such as law. It is not, therefore, particularly instructive. Since 1800 this group had an average of approximately three per cent. Before that time the percentage was somewhat larger, because formerly many more persons went into public life without having preceded it by some other profession.



Professional Distribution of the Graduates of Thirty-seven Selected Colleges from 1660 to 1900.

The total number of graduates who have entered each profession is shown by the following table: —

Law	4117 graduates
Commercial pursuits	3957 graduates
Ministry	2203 graduates
Education	2144 graduates
Medicine	1958 graduates
Public service	464 graduates
Literature and Journalism	453 graduates
Engineering	279 graduates
Agriculture	223 graduates

A somewhat different analysis of the professional distribution of Harvard graduates arrives at practically the same results. The Alumnus Directory of 1910, containing the names of 32,192 living graduates, distributed them as follows: —

Law	5300
Education	3554
Medicine	3337
Commercial pursuits	3598
Ministry	1000
Literature	945
Engineering	944
Public service	529
Agriculture	574

Comparison of Harvard with Other Institutions. — A comparison of the leading professions in the collegiate department at Harvard with the same professions in other leading institutions gives the following results.

Ministry. — The curves for ministry at Harvard and Yale are very similar previous to the Revolution, while that for Princeton is about 10 per cent higher than either during the period between its founding and the war. Columbia University and the University of Pennsylvania had relatively small percentages during this period. During the first half of the nineteenth century the curve for Yale averages about 10 per cent higher than that for Harvard. The curve for Columbia does not differ greatly from that of Harvard during this half century, but the curve for the University of Pennsylvania rises successively above Columbia, Harvard, and Princeton, and by 1850 surpassed Yale. It then took slightly over one fourth of the graduates of the university. The curves for Harvard and Yale converge after 1850, and at the close of the century are both at about five per cent. Princeton's curve after 1850 is higher than that of Harvard, Yale, Columbia, and the University of Pennsylvania, having an average nearly 10 per cent higher than that of Harvard. The University of Pennsylvania held second place during this half century. Yale held third place between 1850 and 1875, while Columbia has held it since that time. The curve for Harvard was the lowest throughout this period. All show the same marked tendency to decline. The curves for Dartmouth, Brown, Union, Williams, and the University of Vermont are somewhat higher than those for the five institutions described above from the time of their founding to the middle of the nineteenth century. During the last half century there is little appreciable difference between the two groups. A third group, including Middlebury, New York, Beloit, and Wabash, averages about 28 per cent for the first half of the nineteenth century, as compared with 20 per cent for the second group and 17 per cent for the first group. The curves of this third group are also higher during the last half of the century. A fourth group, in which denominational influence has been considerable, includes Oberlin, Syracuse, Haverford, Northwestern, and Rochester. The curves for this group are more variable than those for the preceding groups, but are not as a whole higher than those of many institutions in which denominational influence is not so strong. A fifth group, consisting of state institutions, including Michigan, Wisconsin, Minnesota, California, and Illinois, shows that state institutions have not contributed largely to the profession of the ministry. The curves for this group are on the whole lower than any of those in the preceding groups.

Law. — The curve for law at Harvard runs lower than that for Yale during the latter part of the eighteenth century. Between 1800 and 1865 they are very similar. After that time Yale's curve runs somewhat higher than that of Harvard, though at the end of the century neither is far from 20 per cent. The law curve at Columbia is not very dissimilar to those of Harvard and Yale, until after 1860. It then runs considerably higher than either of them, and at the close of the century is higher than any other of the twenty-five institutions included in this comparison of professions. The curve for law at the University of Pennsylvania is more variable than those of Harvard, Yale, and Columbia. During the later years it is lower than any of these. The law curve at Princeton does not differ greatly from those of Harvard and Yale during the early part of its history. After 1850 it shows a sharp rise, but then declines even more rapidly, and is lower at the end of the century than those of Harvard, Yale, and Columbia. Group II (cf. above) is not homogeneous. Dartmouth and Union do not differ greatly from Group I. The University of Vermont is higher than Group I until after 1860, and lower than any of these at the close of the century. Brown's curve is on the whole about 10 per cent lower than any of Group I, and Williams' curve is lower than Brown's previous to 1860, but at the close of the century has about the same percentage as that for Harvard. The average of the curves of the third group does not differ greatly from that of the curves of the first group, but the decline is more rapid in the third, and at the close of the century its curves are decidedly lower. The curves for the fourth group, which includes institutions of denominational tendencies, are lower than those of any of the other four groups. The fifth group, *i.e.* state universities, is not strikingly different from the other groups. The curves are somewhat lower than those of Group I for the same period, and decline more rapidly. They are higher, however, than those of Group IV, but do not differ materially from the curves of Groups II and III.

Medicine. — The curves for medicine for Harvard and Yale are very similar throughout their entire course. Princeton's curve is at first somewhat lower, but during the last half of the nineteenth century its average is approximately that of Harvard and Yale. Columbia's curve runs a little lower than those of Harvard, Yale, and Princeton. The curve for Pennsylvania is more variable than that of any other institution in this group. Its general average between 1820 and 1870 is higher than that of the other institutions, but after that date is somewhat lower than the average for Harvard, Yale, and Princeton. The general average of the second group is not quite so high as that of the first group during the first half of the nineteenth century. The curves for this group are also somewhat more constant in their variation about a central tendency of 10 per cent after the middle of the century. The curves for Group III, particularly during the last half of the nineteenth century, are more variable than those of Groups I and II, and their general average is a little lower. The fourth group is slightly lower than the preceding group, and accordingly perceptibly lower than the first two groups. Haverford is, however, a conspicuous exception to this between 1836 and 1870. For a time medicine took nearly 25 per cent of the graduates, but declined to about 10 per cent by 1870, and since 1880 has taken only about four per cent. The group of state institutions shows a general average which is a little higher than that of the denominational institutions of Group IV, but lower than that of the other groups.

Education. — During the eighteenth century Yale's curve for education averages from two to three per cent lower than that of Harvard, and the curves for Columbia, Princeton, and Pennsylvania do not differ greatly from that of Yale, though they are somewhat more variable. During the nineteenth century the curves for Harvard, Yale, and Princeton rise from an average of about three per cent to about 13 per cent in 1840. Pennsylvania and Columbia show a somewhat similar but more rapid rise. After 1840 there was a temporary decline in all of these institutions, but from 1860 to 1900 the rise in each is rapid. After 1860 the curve for Harvard leads the group. The rise at Columbia after this date is very marked. Previous to 1860 its average was the lowest in the group, whereas at the close of the century it was exceeded only by the curve for Harvard, and this exceeds it by only two per cent. The average percentage of the institutions in the second group is higher than that of the institutions in the first, as shown by the fact that during the nineteenth century the general average for the second group rose from six per cent to 16 per cent, as compared with a rise from three per cent to 13 per cent for the first group. The third group is less homogeneous than the first two groups, but its average is higher. During the latter part of the nineteenth century this group rises much more rapidly than the two preceding groups. The fourth group, including denominational institutions, is even less homogeneous than the third group, and in turn is higher than any of the preceding groups. Its rise during the last few years of the nineteenth century is not as conspicuous as that of the third group. The state institutions show a more rapid and continuous rise than any curves of the other groups. Michigan, Wisconsin, and Minnesota each show percentages above 45 per cent at the close of the century.

Commercial Pursuits. — During the first third of the eighteenth century commercial pursuits show a rapid tendency to rise at both Harvard and Yale, culminating in 18 per cent for the former and 15 per cent for the latter. During the remainder of the century their curves are very similar, and the central tendency is approximately 12.5 per cent. Columbia, Pennsylvania, and Princeton, after their appearance at about the middle of the century, show much lower tendencies. During the nineteenth century, the general tendency of all the curves in the first group is to rise from about 10 per cent to approximately 30 per cent. All indicate the panics of 1837, 1873, and 1893 by depressions in their curves for those periods. During the first third of the century Harvard's curve is lower than any of the others, but rises to 28 per cent by 1865, and from this time until 1890 it is the highest curve. It is then exceeded by the curves for Yale and Princeton. Columbia's curve is the highest between 1810 and 1855, but at the close of the century is lower than any of the others. There are no striking differences in the first two groups, although the curves of the first group are a little lower than those of the second at the close of the century. The older institutions of the first group also seem to have been less affected by the financial depressions of the century. The curves for the third group are more variable. They rise more rapidly during prosperous business periods, and respond much more quickly to business depressions. The denominational institutions of the fourth group show the greatest diversity. Two of them, Northwestern and Rochester, unlike all others, show a general declining tendency, while Haverford has a higher average percentage than any other of the institutions in any of the groups. The state institutions show the greatest uniformity. They start with low percentages and rise rapidly until about 1880, and then decline until the close of the century. Their maxima vary from 16 per cent to 21.5 per cent, and at the close of the century their percentages vary from 7.5 per cent to 13 per cent.

Combined Statistics for Thirty-seven Representative Institutions. — The accompanying chart (p. 92) gives graphically the statistics for the collegiate departments of the following representative institutions: —

1. Harvard
2. Yale
3. Princeton
4. Pennsylvania
5. Columbia
6. Brown
7. Dartmouth
8. Dickinson
9. Williams
10. Union
11. Middlebury
12. Washington and Jefferson
13. Vermont
14. Bowdoin
15. Colgate
16. Miami
17. Hanover
18. Wesleyan
19. New York
20. Wabash
21. Haverford
22. Oberlin
23. De Pauw
24. Michigan
25. Bucknell
26. Beloit
27. Syracuse
28. Rochester
29. Wisconsin
30. Northwestern
31. Chicago
32. California
33. Minnesota
34. Nebraska
35. Vanderbilt
36. Colorado
37. Pomona

The results may be summarized very briefly as follows: —

Ministry. — Ministry starts with 70 per cent, and does not decline conspicuously until after 1720. Between 1720 and 1780 the decline is more marked than at any other time. A slight rise is found between 1780 and 1840, with a maximum percentage of 32.3 per cent. Since that time it has steadily declined, and at the close of the century has a percentage of 5.9 per cent. From 1642 to 1840 it was the dominant profession, with one exception, namely, the period 1780 to 1820, when it was exceeded by law. At the close of the century it is surpassed by teaching, commercial pursuits, law, and medicine.

Law. — At no time previous to 1750 does law have a percentage greater than 10 per cent. After 1750 it shows a tendency to rise, and takes about a third of the graduates at the close of the century. This is the maximum percentage for the whole history of the profession of law. During the nineteenth century it declined, with one exception, the decade 1865 to 1875, which was due to the increased stimulus to enter law because of the founding of law schools during this period. The increase was temporary, however, and by the close of the century law took only about 15 per cent of the graduates and was surpassed by both teaching and commercial pursuits.

Medicine. — In spite of the fact that the curve for medicine was extremely variable during the earlier years represented on the chart, it may be said that medicine has been the most constant of all the professions among college graduates. The conspicuous variations during the first period occur when there was no college but Harvard. The relative constancy of the curve is shown by the fact that between 1750 and 1895 no five-year period has less than 7.2 per cent or more than 13.4 per cent, and the general average is between 9 per cent and 10 per cent.

Teaching. — Previous to 1700, the curve for teaching represents Harvard only, and varies from 20.5 per cent. During the eighteenth century it varies but little from five per cent. By 1850 this had risen to 10 per cent, by 1875 to 13 per cent, and by 1900 to 26.7 per cent. Within one hundred years, therefore, the profession rose from a position taking about one twentieth to one taking about one fourth of the graduates. Previous to 1875 teaching was surpassed by ministry, law, and medicine, but after this time it exceeds medicine. Since 1880 it has been higher than ministry, since 1890 higher than law, and at the close of the century is the dominant profession, with commercial pursuits as its closest competitor.

Commercial Pursuits. — While this group scarcely appears before 1700, during the next century the curve representing it has an average percentage of approximately 9.5 per cent. During the first quarter of the nineteenth century, however, the general average fell to 6 per cent. From that time until the present the curve has risen steadily, and at the close of the century represents one fifth of the graduates and is exceeded only by that for teaching. It will be noted that the financial panics of 1873 and 1893 are strongly emphasized by depressions in the curves for this group.

Minor Professions. — The curve for engineering does not appear until after 1825. Its rise from that time until the end of the century is steady but never rapid, and at no point does the curve reach as high as 5 per cent. Farming has never attracted many college graduates. The maximum percentage is 3.9 per cent, and since 1700 the percentage has been greater than one per cent in all of the five-year periods except five. Three of these are the last periods in the nineteenth century. Previous to 1830 literature and journalism did not take more than one per cent of the graduates. Between 1830 and 1855 the percentage rose from one per cent to two per cent, and by 1885 reached its maximum, 3.3 per cent.

B. B. B.

See University Graduates, Professional Distribution of.

COLLEGE OF THE CITY OF NEW YORK. — See New York, College of City of.

COLLEGE OF THE IMMACULATE CONCEPTION, NEW ORLEANS, LA. — See Jesus, Society of, the Educational Work of.

COLLEGE, PREPARATORY DEPARTMENTS IN. — See Preparatory Schools.

COLLEGE PROFESSORS, SALARIES OF. — United States.— Considering as a group the hundred colleges and universities which are strongest financially, statistics show that the college teacher who has received his bachelors' degree, taken a post-graduate course, and prepared himself for the profession of teaching, may hope to obtain at the age of 28 a salary of $1250, at 31 a salary of $1750, at 33 a salary of $2250, and at 35 — at which age the able man will have gained his professorship — a salary of $2500. If we consider all of the institutions in the United States which are legally entitled to call themselves colleges or universities, the average salary of the professor is not more than $1000 a year. The majority of these institutions, however, are colleges only in name; they are academies, and combinations of the academy and the college.

Before discussing the actual salaries paid to college teachers, it is important to remember that no man is likely to choose an academic life for the love of gain, or from considerations of material advancement. The great majority of college teachers consider but slightly the financial returns of their profession on a competitive basis with other professions. The attraction which leads able men into the teacher's calling springs from two sources — first the sense of power and responsibility which the true teacher feels; second, the love of study and of the scholar's life. Institutions of higher learning, whether they devote themselves to religion, technology, or literature, maintain honestly that they stand for truth. Sensitiveness for honor is high in officers and students; and the professor must not only be a part of this forward movement, but he must be a leader in it. Success comes to him only by taking worthily the position accorded to him. This leadership, which involves personality, character, and scholarship, reacts upon the professor himself at the first moment of success, and in this fact lies the secret of his devotion to his work. The professor's life becomes permeated with a quiet force, the value of which is realized only when one comprehends what a power a student body is for good or evil. These students not only are a power among themselves, but they are a tremendous influence upon the community, and it follows naturally that every action of the professor touches vitally the stability of the community and of the country. Such leadership brings with it a reward compared with which a few hundred dollars one way or the other in salary are of small significance. The professor does not accept other men's valuation of his work when it is estimated by the tuition fees of his students; but, held in a position of highest dignity by those about him, he lives a life of frugality, of simplicity, of influence, and above all, of happiness. He lives as, Mr. Lowell observed, in the only recognized aristocracy in America.

The second important consideration for the professor is his opportunity for research. Since the development of graduate schools in American universities, it is no longer sufficient for the professor to be merely a middleman in the distribution of knowledge, passing on year after year the same information taken from the same textbooks. An important function of the modern university is the extension of knowledge; and a university, in order to maintain its rank among the leading institutions of its kind, must contribute to this extension. It must be productive. The professor, therefore, feels it a duty to his college or university and to his own standing in his profession to keep in touch with what is being accomplished by scholars all over the world in his special department of study. He must himself be a productive scholar. In such work he finds great reward in terms of worth and dignity and intellectual satisfaction. Under the present salary schedules and administrative methods in many American universities this scholarly productiveness is carried on against greater obstacles than are similarly presented in the universities of Germany and of England. The scholar's work is seldom remunerative in a financial sense. The writer of popular textbooks and magazine articles receives not only a fair financial return for his work, but also obtains a popular reputation which is to his advantage. The scholar, on the other hand, who by his industry becomes a first authority in any branch of science or literature, will receive scant financial return for the publication of his monographs, but he wins through such publication high honor and respect among scholars for himself and for his university.

The following paragraphs are a survey of college teachers' compensation in currency. Fifteen institutions pay a maximum salary of $4500 or more; 5 of these pay some salaries over $5500. In 32 institutions the maximum salary is $3000 or more. The following institutions are at the head of the list, with the average salary of the full professor as follows: College of the City of New York, $4788; Harvard University, $4413; Columbia University, $4389; Leland Stanford Junior University, $4000; the General Theological Seminary, $4000 and a residence; University of Chicago, $3600; University of Toronto, $3600; Yale University, $3500; University of Pennsylvania, $3500.

The salaries of professors in a representative group of smaller colleges which offer a high grade of instruction are as follows: Beloit College, $1650; Bowdoin College, $2402; Centre College, $1630; Drury College, $1400; Hamilton College, $1890; Grinnell College, $1450; Knox College, $1580; Smith College, $2150; Stevens Institute of Technology, $3130; Trinity College, $2070.

The income of college teachers, however, is often larger than the figures as given represent. A large proportion of law school teachers, for example, are practicing lawyers or judges sitting on the bench. In medical schools few professors are not engaged in active practice; often the professorship is accepted because of the prestige it confers rather than for its direct emolument. In engineering schools professors are generally in active consultative work, and in one of the largest schools of this kind it is estimated that every professor doubles his salary by fees. In the academic departments the opportunities for profitable employment outside the college are fewer. A certain amount of analysis is done by the scientific professors, and in the language departments of universities situated in great cities the professors of distinction are sometimes in possession of lucrative offices with publishing firms. Outside of these exceptions, lecturing, magazine writing, and the editing of new editions are about the only sources of additional income, and the receipts from these sources are seldom large.

In most institutions there is a professorial grade below the rank of the full professor, frequently two grades. These grades, styled without much uniformity associate professor, assistant professor, or adjunct professor, pay in the hundred strongest institutions an average salary of $1900 to the associate professor, and of $1600 to the assistant professor. The largest average salary of the associate professor and of the assistant professor is paid by Harvard University — $3400 and $2719 respectively.

The grade of instructor represents as a rule a teacher giving full time to the college, but doing so at the beginning of his career, with high probability of advancement if he proves efficient. The average salary for this grade is a little over $1000.

A study of the question of college salaries shows that the variation in compensation corresponds in considerable measure to the variation in the cost of living. It is clear that in a small town in the middle west, in which house rent is $200 a year, and in which servant hire is $10 a month, a salary of $2000 may well be a comfortable one, while a salary of $4000 in New York will not secure equal advantages. In other words, there is for each locality an approximate line of comfort in the remuneration of such a member of the social order as a professor. The individual receiving a salary above this line is comfortable; the individual receiving a salary below it must have more or less worry over the financial problem. G. H. M.

England. — It is difficult to make any but a general statement with regard to salaries in English universities, since no returns are published. It is usual for a lecturer to enter on university work at a salary of from £120 ($600) to £150 ($750). From this minimum he may rise to a professorship the salary of which may vary from £300 ($1500) in the smaller universities to £1000 ($5000) or more, if the chair be well endowed.

Germany. — Salaries of professors in the universities of Germany are paid by the State.

While certain scales of pay exist, the professors can always add to their salaries by the receipt of a portion of the fees. The ordinary professor (*ordentlicher Professor*) receives in Prussia from 4000 M ($1000) to 6000 M ($1500) outside Berlin, and 4800 M ($1200) to 7200 M ($1800) in Berlin. To these sums must be added compensation for rent, which varies with the location of the university. In Bavaria the salaries of professors are from 4560 M ($1120) to 6000 M ($1500), with compensation for rent. In Saxony the minimum is 3000 M ($750). These salaries are in most cases considerably increased by the fees. The extraordinary professor (*ausserordentlicher Professor*) in Prussia, if salaried, receives from 2000 M ($500) to about 6000 M ($1500), but the receipt from fees is much smaller. The privat-docents receive salaries only in rare cases.

Professors, when no longer able to continue their work, are retired on full pay in most universities; in Leipzig a pension is arranged by agreement. Widows and orphans of professors receive a small allowance usually from the university treasuries.

See Pensions for Teachers.

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COLLEGE, RELIGIOUS LIFE AND INFLUENCE IN THE AMERICAN. — See College, American: Student Life; Student Volunteer Movement.

COLLEGE REQUIREMENTS FOR ADMISSION, OR COLLEGE ENTRANCE REQUIREMENTS. — The term "requirements for admission" among institutions of higher learning is one which covers the moral, physical, and intellectual qualifications deemed prerequisite for enrollment as a student in a given course or department. Some explanation of the three phases of these requirements follows. The moral requirement is usually not more than a "statement of good character" from a responsible person on behalf of the candidate. The physical requirement is (1) the attainment of a minimum age ranging variously from 14 to 18 years; and (2) soundness in body and mind. The latter is, as a rule, an unwritten requirement.

The intellectual requirement, which embodies the main problem of college admission, includes the satisfactory completion of a group of studies based upon the work of the first seven or eight grammar grades. For convenience this academic work is frequently expressed in terms of units. Thus, the subject of plane geometry is estimated at one unit, and four books of Caesar are estimated at the same value. A unit represents approximately one fourth of a year's work in a high school or an academy. Sixteen such units are ordinarily completed in a four-year high school course. Both in theory and in practice we have colleges whose courses, leading to collegiate degrees, are based on from three to 16 of these units. In effect a college which requires only three units of academic work for admission is a high school with some college work offered in its higher classes. The leading colleges and universities have, however, after long evolution, arrived at a fair degree of uniformity in entrance standards; the variation ranges from 14 to 16 units. Thus Yale requires 14.5 units; the University of Michigan, 15 units; Leland Stanford, 15 units; Harvard, 16 units.

With regard to the exact subjects required, both principles and practice have undergone great change in the last decade. Colleges and universities have recognized that almost any study which is worthy of a place in a high school course is acceptable for admission to college. Manual and industrial subjects are accorded respect with the traditional classical subjects. At this time most of the leading colleges divide their entrance subjects into two groups: (1) the *specified subjects;* (2) the *elective subjects*. The amount of the first group varies from 3 units to about 12 units. From two to three years' study of English is usually specified; also algebra through quadratics, plane geometry, and a year or more of foreign language. The full quota of the requirements may then be made up from electives, which include studies in history, science, mathematics, language, economics, music, and the manual and industrial subjects. As an illustration, the entrance requirements to the University of Minnesota are herewith given: —

Specified subjects:

English	3 units.
Elementary algebra	1 unit
Plane geometry	1 unit.

In addition to the above, 9 units must be offered from the following group of electives. The number of units as stated after each subject is the maximum amount of credit which may be obtained in that subject.

Elective subjects:

Mathematics	1 unit	Norwegian-Swedish	2 units
Latin	4 units	History	3 units
Greek	2 units	American government	.5 units
German	2 units	Science	6.5 units
French	2 units	Business subjects	6.5 units
Spanish	2 units	Manual subjects	9 units

Diversity of the administration of entrance requirements has an important bearing upon the entire problem. Some institutions admit students only upon examination (Bryn Maur, Columbia, Harvard, Haverford, Princeton, Radcliffe, Stevens Institute of Technology, Yale). Some admit students upon certificates from secondary schools (see Accredited Schools); some on probation upon the recommendation of high school principals. The great majority of institutions admit students on certificates, a system which in many instances includes an intelligent inspection of the high schools from which certificates are acceptable. In Minnesota, for example, this inspection is made under the supervision of the state superintendent of instruction; in Iowa, Missouri, Kansas, and other states the inspection is made under the supervision of the respective state universities and their lists of "accredited schools" and of "partially accredited schools" are generally used by the other first-grade colleges of the states. (See ACCREDITED SCHOOLS.)

Students are usually admitted to college under one of three general classifications: (1) regular students, those who have met fully the entrance requirements and who are candidates for a degree; (2) conditioned students, or those who have failed by a small margin to meet the full requirements, but who are admitted as candidates for a degree; (3) special students, or those who do not meet the regular entrance requirements, but who, usually on account of maturity of years, are deemed qualified to enter certain courses. Such students are not candidates for degrees.

The purposes of entrance requirements may be summarized briefly. They aim (1) to eliminate from college classes students unfit to pursue the work to their advantage; (2) to vitalize and to stimulate secondary schools by well-guarded articulation. It follows that the requirements serve to protect the scholarly standards both of the high schools and of the colleges.

Historical Development in America. — The history of college entrance requirements begins with the formulation of the first statutes for Harvard College in 1642, though the work of the college began four years earlier. These statutes provide: "When any Schollar is able to read Tully or such like classical Latin Author extempore, and make and speake true Latin in verse and prose, without assistance, and decline perfectly the paradigms of nounes and verbes in ye Greeke tongue, then may hee bee admitted into ye College, nor shall any claime admission before such qualifications." These requirements remained without material change until near the middle of the eighteenth century (1734). Even then the change was slight, a "speaking knowledge of Latin" was no longer required; and a knowledge of the rules of prosody could be substituted for the making of Latin verse. While the essential requirement in all colonial colleges was the grammatical knowledge of Greek and Latin with an ability to read easy Latin at sight, the colleges founded in the eighteenth century made further progress in the adjustment of the college curriculum to changed social conditions, and these were reflected slightly in the entrance requirements. In 1745 Yale, which hitherto had followed Harvard, added "common arithmetic" to the entrance requirements. Princeton, formulating its entrance requirements in 1748, followed the earlier custom of Yale, and required only Latin and Greek. Columbia, adopting its first regulation in 1755, included "arithmetic so far as the rules of reduction," with Latin and Greek. Brown and Williams included arithmetic in the last decade of the eighteenth century, and Harvard shortly afterwards. The quantitative requirements in arithmetic were not usually specified, but those in Greek and Latin, so far as reading knowledge was concerned, gradually increased and became more specific. The classical requirements practically everywhere were ability to read Cicero's Orations, Vergil, Sallust or Cæsar, and the Greek Testament. With the dawn of the new century, new social outlook, and new educational problems, the offerings of the college course increased rapidly and the entrance requirements responded similarly to the changed conditions. In addition to the expanded college curriculum (*q.v.*), the chief factor in bringing about a higher standard of admission was the substitution of the academies (*q.v.*) for the old Latin grammar school (*q.v.*) as the dominant secondary school. The academy offered the greatest variety of subjects for study, many of them of a more practical character, and in many ways was more responsive to changed social conditions. The chief modification made in the requirements for entrance during the first generation of the nineteenth century was the substitution of definite quantitative requirements of so many authors or texts read for the earlier test in ability to speak, read, or versify.

First of the new subjects required was geography, required by the Harvard statutes of 1807. Princeton made a similar requirement in 1819, Columbia in 1841, and Yale in 1822. English grammar was probably first required at Princeton in 1819. Yale followed in 1822, and the other colleges later. Algebra was first required at Harvard in 1820; Columbia followed with this requirement in 1821, Yale in 1846, and Princeton in 1848. Meanwhile the classical requirements were increased and the recognition of the problem of the overburdened college curriculum was given in 1832, when Columbia temporarily established a parallel course, — a scientific and literary one. For entrance to this French was required.

The great number of colleges founded during the early part of the nineteenth century represented newer educational ideas, attempted to meet more directly the new conditions, many of them of a frontier region and all less bound by tradition than the older institutions founded during the seventeenth and eighteenth centuries. Michigan University, opened in 1841, made the following requirements for admission: "Geography, arithmetic, the elements of algebra, the grammar of the English, Latin, and Greek languages, the exercise and reader of Andrews, Cornelius Nepos, *Vita Washingtonii*, Sallust, Cicero's Orations, Jacobs' *Greek Reader*, and the Evangelists." This was increased six years later as follows: " English Grammar, Geography, Arithmetic, Algebra through simple equations, Kreb's *Guide for the writing of Latin*, Latin Reader, Cornelius Nepos, Cicero's Orations, Vergil's *Bucolics* and six books of the *Æneid*, Greek Reader through, Latin and Greek Grammar, Keightley's (or Pinnock's Goldsmith's) *Grecian History to the time of Alexander the Great, and Roman to the time of the Empire.*"

Geometry appears as a college entrance requirement first at Yale in 1856, followed by Princeton, Michigan, and Cornell in 1868, and Columbia in 1870. History was first required in 1847, at both Harvard and Michigan, and at Cornell in 1868. History of the United States was required in 1870 at Michigan. Physical geography was added by Harvard and Michigan in 1870. The modern languages had received little recognition in the college course, and it was not until 1875 that an elementary knowledge of either French or German was required (at Harvard), for admission to the A.B. course. Other colleges followed. In 1897, however, only 60 of the 432 colleges reporting to the United States Commissioner of Education required a modern language for admission to the traditional (A.B.) college course, while 402 of the 432 required Latin and 318 Greek.

Since 1870 the expansion of requirements in the new subjects has been along the line of English and of the natural sciences. The great number of colleges now becomes prominent, the divergence in their customs concerning entrance requirements, the great increase in the quantitative requirements in the subjects previously required, the restrictive influences which began to be exerted by the colleges upon the secondary schools through the multiplicity and definiteness of requirements, all render it impossible to trace in a brief space the further development of these subjects individually; and these factors together give rise to the present-day question.

The Problem of College Entrance Requirements. — Until a comparatively recent time the only means of passing from the secondary school to the college was through an examination, given at the college, in certain prescribed subjects. This plan fixed upon the schools in an absolute manner both the course of study and the type of instruction which the colleges required of them. With the widening of the range of college subjects, there was a widening of the courses in the schools. But the schools could not afford to go much beyond the subjects demanded by the colleges. Many high schools had, however, grown up as public institutions designed to give a training different from the narrow and highly specialized work of the academies and preparatory schools. These schools gave courses primarily in science, mathematics, history, and the modern languages; while the academies confined themselves mainly to Latin, Greek, and mathematics.

A number of causes tended to break down this division. The widening range of courses in the colleges referred to above, and especially the elective system, and the economic waste involved in maintaining two types of school, led to the absorption of many of the old academies into the public school system. Another factor was still more potent. The Western state universities, led by Michigan in 1870, began to adopt the plan (borrowed from the state system of Prussia) of admitting without examination all students certified by schools satisfactory to the university in courses and in the number and grade of the instructors. Michigan offered to send to any school, upon request, a committee that would inspect the work of the school and report to the university, which would determine whether the school in question should be placed on the accepted list. Fifteen years later, the same privilege was extended to high schools outside the state. This system of accrediting schools was soon followed by other universities: by Indiana in 1874, Wisconsin in 1879, California in 1884. By 1897 there were 42 state colleges and universities, and about 150 others, in which some form of admission by certificate was allowed. At the present time only a few of the larger and more conservative colleges (and those in the East), admit only by examination. The certificate privilege, though it exists in almost all the colleges, is, of course, not available for all candidates. Pupils from unaccredited schools, and those prepared by private tutors, must still take examinations even in certificating colleges. The net result of these various causes is, speaking generally, a broad difference between the relation sustained by the high schools to the colleges in the states west of the Appalachians and that existing on the Atlantic seaboard. In the former, there is a fairly unified system, in which the entrance from school to college depends only upon the fact that the school is assumed, upon certain evidence, to have given a sound course of instruction of the required sort; in the latter, there is a divided usage; some colleges insist upon the formal examination, others accept certificates. The colleges, in either case, are positive of the wisdom of their plan; the schools naturally prefer the certificate or accrediting system.

Those who favor the examination as the means of admission argue (1) that the college examinations have done much to build up the standards of instruction in the schools, and that a remission of the plan would be followed by a deterioration on the part of the schools; (2) that the examination tends also to keep up the colleges themselves to a high standard of admission; (3) that the range of choice in subjects makes the examinations a fair and liberal test of a student's abilities; (4) that it tends to a desirable uniformity of standards both in school and colleges; (5) that the examinations, as conducted, do not unfairly rate the student, even though he takes them under strange and rather difficult conditions; (6) that the knowledge that he must pass such a test braces a pupil for his best efforts, and that, when he passes them, he gains a sense of confidence and power; (7) that the privilege of certification is often abused by principals, especially under pressure from parents or school boards; (8) that under infrequent or incompetent inspection poor schools often remain on the list; (9) that competent inspection is difficult and costly; (10) that the colleges requiring examination get better prepared students than do the certificating colleges. As will be seen, many of these arguments are statements of fact whose value depends upon proof of the fact. At present there is no scientific evidence to establish or to refute many of these points; consequently they remain, as yet, matters of opinion.

The arguments for the certificating or diploma system are also many, and, like the others, not all established. (1) Such a system, by removing arbitrary barriers, brings about a closer union between school and college, thus leading more boys to go to college; (2) under such a system college teachers and high school teachers come to understand each other's work better, to the great advantage of both fields; (3) inspection lifts the standard of high school work; (4) it allows more freedom in instruction, and so gives a better chance to the boy who is not going to college; (5) "cramming for examination," a confessed evil, disappears, and the pupil may study the subject for itself rather than as a subject to be examined in; (6) the school record of a boy's work, extending over four years, and taking into account his personal qualities, is a fairer test than any brief and impersonal examination; (7) the conditions under which examinations are taken place the candidate at a grave disadvantage; (8) the certificate system secures a better grade of pupils.

One of the most effective and far-reaching movements in this whole field is the work of the College Entrance Examination Board (*q.v.*). Its influence has been distinctly in the direction of maintaining uniformity in the courses and establishing uniformity in the nature of the instruction. Its examination questions are studied by teachers as a guide in their work; and its standards help the weaker schools to keep to a fair level of achievement.

College Entrance Requirements in Latin and Greek. — Fo. a number of years after 1870 there was no essential change in the requirements for entrance to college in Latin and Greek. There was substantial agreement upon the main authors required: *i.e.* in Greek, Xenophon's *Anabasis* and Homer; in Latin, Cæsar, Cicero, and Vergil; but there was wide divergence as to the amounts of these particular authors required, and a number of colleges required the substitution of other authors for parts of these; so in Greek, Herodotus and parts of Xenophon's *Hellenica* or Lysias, and in some cases any classical author. In the case of Homer some made no requirements of special books, others allowed the substitution of parts of the *Odyssey* for the *Iliad*, etc., in Latin, for Cæsar, Nepos, or selections from a reader, for Vergil, parts of Ovid, for some parts of Cicero, Sallust, etc. There was a wide divergence in the amount required. It varied in Greek from two to four books of Homer. In Latin, while the requirements in Cæsar (or a corresponding amount of Nepos) and in Cicero (or a corresponding amount of Sallust) were generally the same, the colleges varied in asking from two books of Vergil to nine, and a number required the *Georgics* and the *Eclogues*. A large proportion of the colleges required an examination in sight translation in both subjects, following the example set by the University of Michigan, and the confusion was so extreme that Dr. Bancroft, the principal of Phillips Exeter Academy, remarked in 1885 that "out of over forty boys for college next year we have over twenty senior classes." The confusion was rendered worse confounded by the action of Harvard University, which in 1886 substituted for the specific requirements hitherto in vogue a general requirement of sight translation of simple Attic prose and verse and simple Latin prose and verse. This example was followed more or less by other colleges, particularly Bryn Mawr, which adopted the same plan in 1894.

The lack of uniformity in the entrance requirements in classics was represented in other directions, and led to the appointment in 1895 by the National Education Association of a committee to inquire into and report upon the whole subject of college entrance requirements. This committee gathered together a large amount of material with regard to the varying conditions in the United States, and published a preliminary report in the *School Review*, Vol. IV, pp. 341–460. At about the same time the American Philological Association appointed in December, 1894, a Committee of Twelve to take into consideration the question as to the amount of Greek and Latin needed for the various courses in secondary schools. This committee in 1896, at the suggestion of the National Education Association, was further directed to prepare at its convenience a report on the proper course of secondary instruction in Latin and Greek. After a vast amount of labor the commission finally made a report at the meeting of the American Philological Association in 1899, printed in Vol. XXX of the *Transactions*, Appendix, p. lxxvii.

The problem with regard to the courses in Greek was comparatively simple. The requirements for the three-year course are divided as follows. (See American Philological Association *Transactions*, Vol. XXX, p. xcvi ff.)

GREEK: 1st year. Introductory lessons; Xenophon. *Anabasis* (20 to 30 pp.); sight reading; writing; grammar. 2nd year. *Anabasis* or other Attic prose (75 to 120 pp.); sight reading; writing; grammar based on *Anabasis*, Bks. 1 and 2. 3rd year. Homer (2500 to 4000 lines); Attic prose (25 pp.).

LATIN: 1st year. Introductory lessons; easy reading (20 to 30 pp. of consecutive text); written exercises. 2nd year. Cæsar, *Gallic War* (4 or 5 books). Other writers, *e.g.* Nepos (two books); prose composition at least once a week; reading aloud, memorizing passages, etc. 3rd and 4th years: Sallust, *Catiline;* Cicero (6 to 9 Orations, including *Manilian Law*); Ovid (500 to 1500 lines); Vergil *Æneid* (6 to 9 books); one period a week in Latin composition, reading aloud, memorizing of selected passages.

The five- and six-year courses were merely amplifications of the four-year course, particularly in increasing the time devoted to the elementary study and adding further work in advance of the fourth year's requirements.

Observers of the results of the examinations of this period, particularly as set forth in the reports of the College Entrance Board, continued to be more and more exercised by the evident lack of success of the teaching of Latin in the schools as a preparation for these examinations; and along with the desire for uniformity in college entrance examinations grew the desire to increase if possible the efficiency of the teaching. The suggestion for betterment in this regard took the form of greatly increased emphasis on sight translation as the only adequate test of preparation in case it could not be made the only test.

These two movements resulted in the resolution passed by the American Philological Association in 1907, expressing its sympathy with the efforts being made to bring about uniformity in college entrance requirements. A further step was the appointment at the meeting of the American Philological Association in 1908 of a commission of 15 members to prepare a scheme for uniform entrance requirements. Its instructions involved the question of stating and modifying the requirements in conformity with the new ideas in teaching. This commission made its report at the meeting of the Philological Association, December, 1909. The report follows in part. (*Classical Journal*, Vol. V, pp. 156–157.)

I. Amount and Range of the Reading Required

1. The Latin reading required of candidates for admission to college, without regard to the prescription of particular authors and works, shall be not less in amount than Cæsar, *Gallic War*, I–IV: Cicero, the Orations *Against Catiline*, *For the Manilian Law*, and *For Archias;* Vergil, *Æneid*, I–VI.

2. The amount of reading specified above shall be selected by the schools from the following authors and works: Cæsar (*Gallic War* and *Civil War*) and Nepos (*Lives*); Cicero (Orations and *De Senectute*) and Sallust *Catiline* and *Jugurthine War*); Vergil (*Bucolics*, *Georgics*, and *Æneid*) and Ovid (*Metamorphoses*, *Fasti*, and *Tristia*).

II. Subjects and Scope of the Examinations.

1. *Translation at sight.* — Candidates will be examined in translation at sight of both prose and verse. The vocabulary, constructions, and range of ideas of the passages set will be suited to the preparation secured by the reading indicated above.

2. *Prescribed reading.* — Candidates will be examined also upon the following prescribed reading: Cicero, Orations *For the Manilian Law* and *For Archias*, and Vergil, *Æneid*, I, II, and either IV or VI at the option of the candidate, with questions on subject matter, literary and historical allusions, and prosody: Every paper in which passages from the prescribed reading are set for translation will contain also one or more passages for translation at sight; and candidates must deal satisfactorily with both these parts of the paper, or they will not be given credit for either part.

3. *Grammar and Composition.* — The examinations in grammar and composition will demand thorough knowledge of all regular inflections, all common irregular forms, and the ordinary syntax and vocabulary of the prose authors read in school, with ability to use this knowledge in writing simple Latin prose. The words, constructions, and range of ideas called for in the examinations in composition will be such as are common in the reading of the year, or years, covered by the particular examination.

The chief and vitally important change in the requirements is the statement in general terms of the amount of Latin reading required, the extremely small amount of definite prescribed work, and the very high value set upon the ability to read at sight. These changes are in line with the most enlightened thinking on the subject by classical teachers of Latin both in this country and in England, and mark a very important step toward the ultimate goal where the sole test of knowledge of Latin shall be the ability to read at sight. (See LATIN IN THE SCHOOLS.) G. L.

College Entrance Requirements in English. — Since 1885 the preparation for college in English has evoked more discussion than any other preparatory subject. Its prominence is, however, comparatively recent. Long after the admission requirements in Latin, Greek, and mathematics were definite in form and respectable in amount, English as an entrance subject was not mentioned. About the beginning of the nineteenth century there appear some slight beginnings. Nothing appeared, however, in the direction of the present full view of English as a preparatory subject, until Harvard, in 1874, required both literature and composition. This requirement was the germ of the present system. "Each candidate," says the Harvard announcement, "will be required to write a short English composition correct in spelling, punctuation, grammar, and expression, the subject to be taken from such works of standard authors as shall be announced from time to time. The subject for 1874 will be taken from one of the following works: Shakespeare's *Tempest, Julius Cæsar, The Merchant of Venice;* Goldsmith's *Vicar of Wakefield;* Scott's *Ivanhoe* and *Lay of the Last Minstrel.*" This plan, with various modifications, was adopted by other colleges: by Michigan in 1878, by Cornell in 1883, by Princeton in 1885, by Columbia in 1891, and by Yale in 1894. By 1897 as many as eighty of the leading colleges had adopted the general plan. Some of the colleges examined on only a single author, as Cooper, Irving, or Goldsmith. But gradually the list grew, until, by 1895, ten or twelve books were required by many of the colleges in place of the half dozen of the earlier requirement. There was still, however, great diversity, not only in the books required by the various colleges, but also in the nature of the examinations. As a result, in a subject at best so indefinite as English, the fitting schools found their task seriously complicated. Various attempts were made to unify and standardize the requirements. The first were by the New England Commission of Colleges (*q.v.*) in 1885, and by the Association of Colleges and Preparatory Schools of the Middle States and Maryland (*q.v.*) in 1887. In 1894 the recommendations of these two associations were brought together, and a revised list of books was agreed upon by both, and adopted. This list was accepted also by the Association of Southern Colleges and Preparatory Schools and by the North Central Association. (See COLLEGE EXAMINATION AND CERTIFICATION BOARDS.) The Committee of Ten (*q.v.*) appointed in 1892 by the National Educational Association, to inquire into the whole matter of secondary curricula, gave especial attention to the unification of the English requirements, and also to a formulation of a course of study and of the principles which should govern instruction in English.

Since 1895 the modification of the requirements has been in the hands of a National Conference on College Entrance Requirements in English. This Conference is a joint committee composed of delegates from the college and preparatory school associations mentioned above, and also from the New England Association of Colleges and Preparatory Schools, and the College Entrance Examination Board (*q.v.*). The reports of this committee, which meets at least every three years, are referred to their respective associations for adoption. In one of its meetings (1897) it was agreed that the English course in the high schools should be the same for the students who were not going to college as for those who were. In this and succeeding meetings of the conference, the courses of study were framed by the Conference with this principle in view. Partly as a matter of convenience, and partly in acceptance of this view, the high schools have pretty generally adopted the recommendations of the conference; which has thus come to set the norm or standard for most of the secondary instruction in English throughout the country. The recommendations have, though frequently modified in the light of experience, not been universally satisfactory at any time, and are not so at present. It has been impossible to meet the special needs of all pupils and the special tastes and judgments of all teachers. But, none the less, the work outlined in these reports is substantially the course of study followed in almost all the good high schools and fitting schools of the country, and is the basis of the entrance examinations in practically all of the good colleges.

The most prominent changes in the recent recommendations of the conference have been (1) in the direction of emphasizing nonliterary themes as subjects for composition, and (2) in enlarging the list of books from which choices may be made. In 1905 the Conference, in response to a general and insistent demand for "more freedom," enlarged the list of books "for reading" from a list of of ten required to a list of forty out of which ten were to be chosen. In 1908 and 1909 the list was still further enlarged. The report of the last Conference, held February, 1909, and making recommendations for the years 1913, 1914, and 1915, indicates the present status of the subjects. (See LITERATURE, ENGLISH IN THE SCHOOLS.) F. T. B.

College Entrance Requirements in Mathematics. — The entrance requirements in mathematics in the American college were very limited until well into the nineteenth century. At present there is a rather uniform requirement in the various colleges of algebra through quadratics and plane geometry. Many Western colleges require plane and solid geometry, receiving students upon certificate, and demanding a less intensive course in plane geometry, but a broader course in the entire elementary field. Technological courses usually require solid geometry for entrance, and often plane trigonometry as well. All colleges give advance credit for higher algebra, solid geometry, and trigonometry, in case these subjects are not required for entrance, but are offered as part of the preparatory work.

The College Entrance Examination Board (*q.v.*), founded in 1900, a voluntary organization of representatives from various colleges and universities, at present sets examinations in the following subjects: (*a*) Elementary Algebra: (i) Algebra to quadratics, and (ii) quadratics and beyond. This is divided into two examinations, the first including roots and the theory of exponents, and the second covering quadratic equations, the binomial theorem for positive integral exponents, and formulas for the *n*th term and the sum of arithmetical and geometric progressions. (*b*) Advanced algebra. This includes permutations and combinations; complex numbers with graphic representation of sums and differences; determinants, chiefly of orders not exceeding four; numerical equations of higher degree, Descartes' rule of signs, and Horner's method of solution. (*c*) Plane geometry. The limitations are not definitely fixed by the board, the statement being: "The usual theorems and constructions of good textbooks, including the general properties of plane rectilinear figures; the circle and the measurement of angles; similar polygons; areas; regular polygons and the measurement of the circle. The solution of numerous original exercises, including loci problems. Applications to the mensuration of lines and plane surfaces." This practically means the plane geometry of Euclid, with an algebraic treatment of ratio and proportion, without the incommensurable cases, and with a large number of exercises. (*d*) Solid geometry. This requirement is also left indefinite, but it covers the ground of solid geometry as given by Legendre, upon whose work most of our American textbooks are based. (*e*) Trigonometry. The requirements are as follows: Definitions and relations of the six trigonometric functions as ratios; circular measurement of angles; proofs of principal formulas, in particular for the sine, cosine, and tangent of the sum and the difference of two angles, of the double angle and the half angle, the product expressions for the sum or the difference of two sines or of two cosines, etc.; the transformation of trigonometric expressions by means of these formulas; solution of trigonometric equations of a simple character; theory and use of logarithms (without the introduction of work involving infinite series); the solution of right and oblique triangles and practical applications, including the solution of right spherical triangles.

It is hardly probable that, with the present school system, the entrance requirements can be materially advanced. They may be changed to cover a broader field less thoroughly, but the time does not permit of any more extended treatment of mathematics save as an elective. It is coming to be felt that two years devoted to mathematics in the high school is all that can be demanded, and in this time it is not probable that more can be attempted than algebra through quadratics and plane geometry.

D. E. S.

College Entrance Requirements in Modern Languages. — Although a number of American colleges had begun to teach French before the end of the eighteenth century, and German in the first half of the nineteenth, yet modern languages were not regarded seriously in American higher education until comparatively recent times. Neither French nor German was required for admission by any American college before 1875. In 1871 Harvard offered an optional admission examination in French for those students who wished to be excused from pursuing this subject in college. In 1875, however, a knowledge of either French or German was required of all candidates for admission. The requirement was defined as "translation at sight of easy French." Proficiency in grammar was accepted as an offset for some deficiency in translation.

For the courses leading to the Ph.B. or B.S. degrees, which had been instituted in many colleges between 1850 and 1870, an elementary knowledge of either French or German was generally accepted in place of part of the requirements in the classics. Still, even as late as 1897, only 123 out of 318 colleges and scientific schools in the United States required a modern language for admission to the B.S. course, while 176 required Latin; of 432 institutions having A.B. courses, 402 required Latin, 318 required Greek, while only 60 required a modern language, and 25 allowed the substitution of a modern language for Greek. (*Rep. Com. Ed.* for 1896–1897, pp. 457–613.) At the present time, modern languages may be freely substituted for Greek in nearly all, and for Latin in very many, of the best colleges, although frequently work in modern languages is still given less weight in the requirements for admission than corresponding work in the classics.

There used to be, and to a certain extent still is, great diversity in the definition of the requirements. Some institutions demanded only the ability to read simple prose and poetry at sight, others prescribed the number of pages which had to be read, while not a few went so far as to examine on certain specified grammars and reading texts. The first step toward securing greater uniformity throughout the country in College Entrance Requirements in the modern languages as well as in other subjects was the *Report of the Committee of Ten* (*q.v.*) (1894), which was followed by the *Report of the Committee of Twelve* of the Modern Language Association of America (1899). The Committee of Twelve proposed three grades of preparatory instruction in modern languages, to be known as the elementary, intermediate, and advanced course, and designed to correspond normally to courses of two, three, and four years respectively. These grades were adopted by the College Entrance Examination Board, and in this way a considerable amount of unification has been accomplished. The aim of the instruction and the amount of work to be done in the different grades, in accordance with the recommendations of the Committee of Twelve, are essentially as follows: (*a*) For the elementary course. Ability to translate at sight easy prose, to put into the foreign language simple English sentences taken from the language of everyday life or based upon a portion of the foreign text read, and to answer questions on the rudiments of the grammar. The work for this course is to consist, in French and Spanish, of the reading of 350 to 575 pages; in German, of 225 to 300 pages; in addition to careful drill in pronunciation, the necessary work in grammar with exercises, and translations into the foreign language. (*b*) For the intermediate course. Ability to read at sight French or German of ordinary difficulty, to put into the foreign language a connected passage of English based on the text read, and to answer more difficult grammatical questions. The amount of reading for this course (the third year of the study) is set down as 400 to 600 pages of French or 400 pages of German, supplemented by grammatical drill and the constant practice in giving paraphrases or writing abstracts of portions of the matter read. (*c*) For the advanced course. Ability to read at sight difficult French not earlier than that of the seventeenth century, or "any German literature of the last one hundred and fifty years that is free from any unusual textual difficulties," to put into the foreign language a passage of easy English prose, and to write in French, or German, a short essay or theme. The French requirement adds: "To carry on a simple conversation in French," while, in German, "the ability to answer in German questions relating to the lives and works of the great writers studied" is demanded. The work of the last year is to comprise the reading of from 600 to 1000 pages of standard French, classical and modern, or of about 500 pages of good German literature respectively, besides the writing of numerous short themes, independent translation of English into the foreign language, and (at least in German) reference readings upon the lives and works of the great writers studied.

While the *Report of the Committee of Twelve*, containing these recommendations, has unquestionably been of very great service to the cause of modern language instruction in this country, the experience of the last decade has suggested certain modifications, which may be summarized, as follows: (1) Quantitatively, the requirements are too large for thorough, intensive work. It is safe to say that, under ordinary conditions, it is impossible to do the prescribed amount of reading in a proper way, if careful attention is to be given to the pronunciation, and if the other very important lines of work which are suggested in the *Report* are to be carried on at the same time. As in other subjects, the tendency is now to reduce the quantity of the requirements, and to enable the schools to do more thorough work and to produce more satisfactory results than they do at present. (2) There is need of still greater definiteness with regard to the reading matter. The terms "easy prose," "prose of ordinary difficulty," etc., even if illustrated, as they are, by a list of suggested readings under the various courses outlined, are rather vague, and the examination, which in a large measure is based on sight translation, becomes correspondingly uncertain as a test of the candidate's real ability. The adoption of a rotary system of tests for the minor part of the work to be done, similar to the system established for C.E.E.B. examinations in English, or the prescription of a definite vocabulary, at least for the elementary course, have been proposed as remedies. (3) There is greater emphasis necessary on oral training and on the understanding of the spoken language. The reform of the methods of instruction in the modern languages which has been going on in European schools for the past two or three decades is beginning to lay hold on American teachers, and must ultimately bring about a modification of the present entrance requirements. This modification will probably consist in some form of an oral examination, testing the candidate's pronunciation of the foreign tongue, as well as his ability to understand the language when spoken and to express himself in it with reasonable fluency and correctness. F. M.

College Entrance Requirements in History. — History received its first recognition as a requirement for entrance to college in 1847. In that year Harvard prescribed Worcester's *Elements of Ancient History*, and the University of Michigan prescribed "Keightley's (or Pinnock's Goldsmith's) *Grecian History to the time of Alexander the Great, and Roman to the time of the Empire*." For some years the requirement was associated somewhat closely with the older requirement in geography. Both at Harvard and at Michigan examinations in the two subjects were given by the department of history, and the questions set bear evidence of an intention to keep the two fields of knowledge related. American history to the end of the Revolution was added by Michigan in 1870, and the classical requirements at Harvard were, during the next decade, occasionally increased by chapters from Freeman's *General Sketch of European History*. Cornell, founded in 1868, introduced at the beginning a requirement of Greek and Roman history. After 1870, the history requirement gained steadily in favor, especially with the newer and smaller colleges. In 1895, out of a total of 475 universities and colleges investigated by the Bureau of Education, 306 required American history; 127, general history; 112, Greek history; 116, Roman history; 57, English history; 9, state and local history; and 1, French and German history. (*Rep. Com. Ed.*, 1896–1897, p. 468.) The knowledge expected must, however, often have been the merest outline, for, as late as 1890, some of these institutions were still using in their own classes textbooks like Swinton's *Outlines*, Anderson's *General History*, and Barnes' *United States*. The diversity of subject matter required was probably greater than in any other branch of instruction.

The first important step in the reform of these conditions was taken by the Madison Conference of 1892. The conference did not feel called upon to frame a definite system of entrance requirements, but its brief discussion of the problem and its recommendations for the general improvement of history teaching in the schools suggested, directly or indirectly, the essential features of the system afterward adopted. The next important step was taken in February, 1895, in the appointment, by the New England Association of Colleges and Preparatory Schools, of a committee of school and college teachers of history to deal with the special question of entrance requirements in history. The report of this committee, adopted by the Association in October, 1895, proposed a list of seven topics, each representing one year's work of three periods a week, and requested the colleges to accept any two of these topics as a required subject for entrance. The colleges were further requested to accept " any additional topic or topics from the list as additional preparation for entrance or for advanced standing," and to recognize as " a considerable part of the evidence of proficiency required " certain specified kinds of written work done in the secondary school. The report suggested that entrance examinations in history should be so framed as to require on the part of the candidate comparison and judgment rather than mere memory, and that they should include tests of geographical knowledge. The use of good textbooks, collateral reading, and practice in written work were to be presupposed. The seven topics were: (1) The history of Greece, with especial reference to Greek life, literature, and art. (2) The history of Rome; the Republic and Empire, and Teutonic outgrowths to 800 A.D. (3) German history. (4) French history. [(3) and (4) to be so taught as to elucidate the general movement of medieval and modern European history.] (5) English history, with especial reference to social and political development. (6) American history, with the elements of civil government. (7) A detailed study of a limited period, pursued in an intensive manner. Three of these topics were in the course of study for secondary schools recommended by the Madison Conference. The other features are directly suggested in the conference report (*Publication* No. 5, New England History Teachers' Association, p.13).

These recommendations were indorsed, a few months later, by the Schoolmasters' Association of New York and Vicinity. The latter had, however, already proposed a conference on the whole question of entrance requirements, and such a conference had, on the invitation of Columbia, been arranged. It was attended by representatives from Harvard, Yale, Columbia, Cornell, Princeton, and Pennsylvania, and made its report on the first of February, 1896. The recommendations of the New England Association relating to written work and to examinations were adopted, practically without change. The principle of a choice of topics was also adopted, but the details were considerably modified. As additional preparation for entrance, or for advanced standing, the Columbia Conference proposed a second group of topics, each representing two years' work of three periods a week: (1) A course of Greek and Roman history for those only who have offered English history and American history as an elementary subject. (2) A course in English history and American history for those who have offered Greek and Roman history as an elementary subject. (3) A course in the history of Europe from the Germanic invasions to the beginning of the seventeenth century. (4) A year's study of any of the elementary fields not already offered as an elementary subject, combined with a year's study of a limited period within that field. (*Publication* No. 5, New England History Teachers' Association, pp. 16, 17.)

In the meantime, the Committee on College Entrance Requirements appointed by the National Educational Association in July, 1895, had been seeking the cooperation of organizations interested in the problem from the point of view of the special subjects. The response of the American Historical Association was the appointment of the Committee of Seven, whose report, made in 1899, remains the standard document on the whole question of history in American secondary schools. In framing recommendations on college entrance requirements the Committee of Seven recognized two things as essential: (1) " that the fundamental scope and purpose of the major part of the secondary schools be regarded "; and (2) " that elasticity be allowed that schools may fit pupils for college and yet adapt themselves to some extent to local environment and local needs." (*Report*, 121.) A " unit " of history was defined, as "either one year of histórical work wherein the study is given five times per week, or two years of historical work wherein the study is given three times per week." The recommendations may be summarized as follows: (1) Institutions with a " system of complete options in college entrance requirements " (*e.g.* Leland Stanford) were asked to accept 4 units in history " as an equivalent for a like amount of work in other subjects." (2) Institutions that prescribed certain studies and, in addition, required others from an optional list (*e.g.* Harvard) were asked to place 1 unit of history on the prescribed list, and 1, 2, or 3 units on the optional list. (3) Institutions with prescribed requirements only, *i.e.* " without options " (*e.g.* Yale), were asked to require at least one unit of history. (4) Institutions with several distinct college courses requiring different groups of preparatory studies for entrance (*e.g.* Michigan) were asked to require 1 unit of history for the classical course; 1 unit for the Latin course; 2 units for the scientific course; and 3 units for the English course. (*Report*, 123–129.) The Committee of the National Educational Association accepted these recommendations, but with the proviso that one year of American history and government should be accepted as a requirement for admission by all colleges and universities. In a similar spirit the recommendation for a year of intensive study was qualified by the phrase, "especially of the United States." (*Proceedings*, N. E. A., 1899, pp. 648, 665.) At the present time, the units most widely recognized are the "blocks" or periods proposed by the Committee of Seven for a four-year course in secondary schools: (1) ancient history; (2) medieval and modern European history; (3) English history; (4) American history and civil government. These are the subjects listed by the College Entrance Examination Board. The question of entrance requirements continues to agitate teachers of history. It is admitted that the action of colleges in recent years in increasing the amount of history that may be offered for entrance has tended to increase the amount of history taught in secondary schools, but its influence on methods of teaching remains questionable. Teachers still complain, as they complained in the days of the Madison Conference, that the present examinations compel the use of "bad methods for college preparation," and they are still urging, as the Madison Conference urged, "a change by which schools which use proper methods shall have some advantage." A Committee of Five of the American Historical Association is now at work revising the report of the Committee of Seven. H. J.

College Entrance Requirements in Science. — The natural sciences appear first in the list of college entrance requirements in 1870, although in some form they had appeared in the college curriculum from the seventeenth century, and some elementary natural science had been incorporated in the elementary or secondary schools for two or three generations. Astronomy, physics (natural philosophy), chemistry, physical geography, botany, and zoölogy (natural history) were made of vital concern to secondary pupils long before the colleges recognized their sigficance in public education. Through the public secondary schools the community gradually forced a change in the higher curriculum. The movement toward public control of education made most rapid progress in the West, where the state universities established the custom of accepting for admission any good four-year high school course. Toward the close of the nineteenth century, the following subjects were included among those satisfying college entrance requirements: astronomy, botany, chemistry, geology, physics, physiography, physiology, and zoölogy. During the last two decades a question concerning the amount and character of the science work to be given by secondary schools and required or accepted by college for entrance has been the subject of prolonged controversy among teachers of science, as has the similar question among teachers of English, classics, and the other subjects of the curriculum. The science controversy has centered on physics, as this is the science most frequently required for college entrance, and most frequently given by the secondary schools. This discussion has given rise to what is popularly known as the "new movement among physics teachers," though it is allied to a larger movement going on among students of this subject both here and in Europe. A syllabus of a list of topics and experiments relating to the metric system, mechanics, heat, sound, light, magnetism, static electricity, and current electricity, has been adopted for the guidance of teachers and examiners. (See PHYSICS IN THE SCHOOLS.)

In 1908 the College Entrance Examination Board (*q.v.*), failing to find a commission of college professors who could agree upon a syllabus of requirements in physics for the secondary schools, appointed six secondary school teachers of physics to undertake the task. These promptly and unanimously prepared a syllabus which the board adopted forthwith and in which all parties concerned acquiesced.

The following gives the substance of these recommendations. (For the content of the course recommended, see PHYSICS IN THE SCHOOLS.)

1. The Unit in Physics consists of at least 120 hours of 60 minutes each. Time spent in the laboratory shall be counted at one half its face value.

2. The Course of Instruction in Physics should include: —

> (*a*) The study of one standard textbook, for the purpose of obtaining a connected and comprehensive view of the subject. The student should be given opportunity and encouragement to consult other scientific literature.
>
> (*b*) Instruction by lecture table demonstrations to be used mainly for illustration of the facts and phenomena of physics in their qualitative aspects and in their practical applications.
>
> (*c*) Individual laboratory work, consisting of experiments requiring at least the time of 30 double periods. The experiments performed by each student should number at least 30. Those named in the appended list are suggested as suitable. The work should be so distributed as to give a wide range of observation and practice.
>
> The aim of laboratory work should be to supplement the pupil's fund of concrete knowledge and to cultivate his power of accurate observation and clearness of thought and expression. The exercises should be chosen with a view to furnishing forceful illustrations of fundamental principles and their practical applications. They should be such as yield results capable of ready interpretation, obviously in conformity with theory, and free from the disguise of unintelligible units.
>
> Slovenly work should not be tolerated, but the effort for precision should not lead to the use of apparatus or processes so complicated as to obscure the principle involved.

3. Throughout the whole course special attention should be paid to the common illustrations of physical laws and to their industrial applications.

4. In the solution of numerical problems, the student should be encouraged to make use of the simple principles of algebra and geometry to reduce the difficulties of solution. Unnecessary mathematical difficulties should be avoided, and care should be exercised to prevent the student's losing sight of the concrete facts in the manipulation of symbols.

The other sciences, botany, chemistry, geography, zoölogy, for which entrance credits are given, do not present a problem of as great importance or significance as physics or the other subjects. Such subjects have been offered only in the last few years (zoölogy for the first time at the College Entrance Examination Board in 1907, and then only by two students); are chosen by very few students, and are not subjects so generally taught in the schools. Consequently the demands of the college influence are not so keenly felt in the schools in these subjects, nor so resented. Requirements for entrance credits are in the process of formulation, and little of a general nature has been agreed upon. The American Federation of the Teachers of the Mathematical and Natural Sciences, representing eight constituent associations, in their meeting in Boston, Dec. 27, 1909, initiated a movement for a reformation of the entrance requirements in chemistry, and presented the matter to the College Entrance Examination Board.

J. H. W.

Other Subjects. — The recently added subjects of drawing and music, similar to the recent addition of science and modern language subjects (that is, botany, zoölogy, Spanish, etc.), have afforded so little experience that no settled policy exists. The following summary of the examinations taken in 1909 under the College Entrance Examination Board indicates with fair degree of accuracy the relative importance of these various branches as subjects for college entrance.

English: (*a*) Reading, 1706, (*b*) study, 1368; total, 3074.

History: (*a*) Ancient, 734, (*b*) Medieval and Modern, 39, (*c*) English 394, (*d*) American 544; total, 1711.

Latin: (*a*) (i) Grammar, 1166, (ii) Elementary prose composition, 1152, (*b*) Cæsar, 941, (*c*) Cicero, 1009, (*d*) Vergil, *Æneid*, I-VI, 433, (*e*) Nepos 0, (*be*) Cæsar and Nepos, 50, (*f*) Sallust, 7, (*g*) Ovid, 14; (*l*) Prose composition, 773, (*m*) Elementary sight translation of prose, 823, (*p*) Advanced sight translation of prose, 189, (*q*) Sight translation of poetry, 110, (*dq*) *Æneid*, I-VI, and sight, 330; total, 6997.

Greek: (*a*) (i) Grammar, 195, (ii) Elementary prose composition, 234, (*b*) Xenophon, 228, (*c*) Homer, *Iliad*, I-III, 66, (*f*) Prose composition, 125, (*g*) Sight translation of prose, 187, (*h*) Sight translation of Homer, 2, (*ch*) *Iliad*, I-III and sight, 105; total, 1142.

French: (*a*) Elementary, 1196, (*b*) Intermediate, 629, (*bc*) Intermediate and advanced, 91; total, 1916.

German: (*a*) Elementary, 1170, (*b*) Intermediate, 741, (*bc*) Intermediate and advanced, 72; total, 1783.

Spanish, 14.

Mathematics: (*a*) Elementary algebra, 1445, (*a*) (i) To quadratics, 266, (ii) Quadratics and beyond, 126, (*b*) Advanced algebra, 143, (*c*) plane geometry, 1425, (*d*) Solid geometry, 237, (*cd*) Plane and solid geometry, 290, (*e*) Trigonometry, 58, (*f*) Plane trigonometry, 334; total, 4324.

Physics 619; *Chemistry*, 439; *Botany*, 18; *Geography*, 25; *Zoölogy*, 9; *Drawing*, 122.

Music: (*a*) Appreciation, 4, (*b*) Harmony, 7, (*c*) Counterpoint, 1, (*d*) Pianoforte, 3, (*e*) Voice, (*f*) Violin; total, 15.

Grand total, 22,208.

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COLLEGE SECRET SOCIETIES. — See Fraternities and Sororities.

COLLEGE STANDARDS. — See College Examination and Certification Boards; College Requirements for Admission.

COLLEGE STUDENT COÖPERATION. — See Student Life.

COLLEGE STUDENTS, AGE OF. — See Graduation, Age of.

COLLEGE STUDENTS, EXPENSES OF. — See Student Life.

COLLEGES, AGRICULTURAL. — See Agricultural Education.

COLLEGES AND PREPARATORY SCHOOLS OF THE MIDDLE STATES AND MARYLAND. — See Association of Colleges and Preparatory Schools of the Middle States and Maryland.

COLLEGES AND SECONDARY SCHOOLS, ARTICULATION OF. — The educational system of the United States is composed of a number of separate institutions, each built up for a specific purpose. It comprises elementary schools, industrial schools, commercial schools, universities, and professional schools. In some cases these types of schools exist without particular reference to one another. In the interest of efficiency a continuity is each year being more and more perfected among these institutions, especially between the secondary schools and colleges.

Historically, any articulation between secondary schools and colleges is an afterthought. Unforeseen social emergencies arise; we endeavor to meet them not by creating out of hand entirely new agencies and institutions, but by converting to our purpose whatever is found available. The high school and the college were at first independent organizations. The academy (*q.v.*), which preceded the high school as the dominant secondary school, was in most cases independent of the college, and in many cases a substitute for it. But the extension of the scope of the college and the increasing frequency with which the high school student was graduated into it suggested and made possible a coöperative relation between them. It is not to be wondered at that some hesitation and confusion have attended the adaptive process. Two types of institutions that have in one section competed for the same body of students, and in another have aimed to do each in its own degree the same sort of service to different groups of the population, do not without friction take position in reference to each other, both subordinating themselves to a single conception.

At the present time most colleges base the work of their freshman classes upon the four-year high school course. With this conception of the relation of the college to the high school, the colleges by means of definite requirements for admission seek to test the fitness of each candidate for admission. (See College Requirements for Admission; College Entrance Examination Boards.)

The first step in the consideration of this subject is the recognition that in the final analysis the college is dependent for its success upon the efficiency and the integrity of the secondary school. If the schools are well conducted and efficient, they will send up well-prepared students; if they are demoralized or inefficient, no certificate of admission and no examination can transform those who come from them into fit college students. The colleges, therefore, by enforcing strictly a reasonable standard for admission protect their own standards of scholarship, and make possible the existence of a secondary school system with which they may coöperate.

Further, the significance of good articulation lies in the ideal of social and intellectual development for which the college stands. That ideal contemplates a group of able, cultured, and devoted teachers living and working in social and intellectual communion with an alert body of youth so nearly homogeneous in age and intellectual equipment that the members of this body react the one upon the other. Such interaction creates the true college life. Its vigorous growth is impossible without such teachers; it is most difficult when the intellectual homogeneity of the student body is discharged. The moment there is introduced into a college class a large proportion of mature students, or of ill-prepared students, the difficulties of instruction are enormously increased, and the general good of the body which the college most directly seeks to serve is sacrificed to give a chance to an entirely different class.

Three classes of students are usually admitted to college: regular students, conditioned or deficient students, and special students. There is no general agreement as to the meaning of these terms. The chief difficulty in differentiating these classes arises out of the fact that the conditioned and the special students cannot be viewed from the same angle with relation to the secondary school. It is clear that all students admitted to college who are over twenty-one years of age do not affect the high schools. They are beyond the usual high school age. On the other hand, any student under twenty-one years of age who has not completed the high school course is still to be thought of as nominally a secondary school student, and his admission to college under any classification serves to confuse the two fields of education.

The following distinctions are now widely in use. (1) Regular students. This group includes all students who have met the full requirements for admission, whether they pursue courses leading to degrees or take special work. (2) Conditioned students. This group includes two classes of students who have not met the full requirements for admission: (*a*) Students enrolled as candidates for a degree; (*b*) students under twenty-one years of age not candidates for a degree, taking special work. (3) Special students. This group includes all students over twenty-one years of age who are not candidates for a degree and who have not met the requirements for admission.

The second group needs a brief explanation. This classification embodies three main types: — (1) Students admitted into the freshman class upon a high school certificate, having completed less than the full four-year high school course. The practice of institutions in the number of deficiencies which may be permitted varies. In some cases students are accepted with as much as a year's work below the stated requirements. (2) Students who have completed satisfactorily a four-year high school course, but who have been conditioned because they are not able to offer the specific subjects for admission. Thus, at the University of Minnesota 15 units are required of all students admitted to the Department of Literature and Arts. No student is admitted who does not present this amount of secondary school work. The university requires, however, that 4 units shall be offered in English, 1 in algebra, and 1 in plane geometry. A student may be conditioned under the rules of this university to an extent not to exceed 1.5 units of this specified work, provided that his total high school credit amounts to fully 15 units. (3) Students who have completed in secondary schools or under private tutors all the studies required for admission, but who have failed in the entrance examinations to pass all these subjects. This group of conditioned students is confined almost exclusively to the institutions which admit only by examination, such as Harvard, Columbia, Princeton, Massachusetts Institute of Technology, Radcliffe, Stevens Institute, Yale, Haverford, and Bryn Mawr.

COLLEGES AND UNIVERSITIES, RELIGIOUS OR DENOMINATIONAL CONTROL OF. — Two thirds of the 750 institutions in the United States and Canada normally termed colleges are organically controlled by religious denominations. This control is exercised generally in one of two forms: either the college is within the legal control of the denomination through the power of an ecclesiastical assembly or dignitary to elect, nominate, or confirm the election of a majority of the board of trustees of the college; or the government of the college is irremovably vested in the membership of a specified denomination through a legal requirement that a majority of the board of trustees must be members of that denomination. Syracuse University, a majority of whose trustees are by the university charter elected by conferences of the Methodist Episcopal Church, is an example of legal control held by the denominational organization; the University of Chicago, whose charter requires two thirds of the trustees to be members of regular Baptist churches, is an example of control fixed in a denominational membership. The University of Wooster, which is governed by trustees elected by the Presbyterian Synod of Ohio, three fourths of whom must be Presbyterians, combines both methods of control. The control by the denominational body exists in two hundred American and Canadian colleges, which are principally those connected with denominations of the episcopal and presbyterial polity; the control through a denominational test exists in 89 American colleges, principally those founded by denominations which have no administrative authority higher than the congregational meeting. The combination of both methods of control is rare. In the Roman Catholic colleges a religious test upon the trustees never legally exists, and the board of trustees is generally legally self-perpetuating, but the fact that the trustees are almost invariably professed members of the religious communal order which founded the college vests the government of the college, through the vows of the trustees, actually in the order. There are in the United States and Canada nearly two hundred such Roman Catholic colleges.

While all of the early collegiate foundations in America owed their origin to religious influence, a legal control by a denomination as such seldom existed. The presence of the ministers of certain towns upon the Harvard Board of Overseers (founded 1636) and the visitatorial power of the Bishop of London over William and Mary College (1693) were primarily regulations of state, though the ultimate object was to perpetuate definite religious views and organization as well as to secure learned governors. The same objects prompted the rule for a clerical majority in the Yale Board of Fellows (1701). Princeton University (1746, then the College of New Jersey), the University of Pennsylvania (1755), and Dartmouth College (1769), never had any legal connection with any denomination. Brown University (1764), with a charter requiring a majority of Baptists on both governing boards, is the earliest case of a legal denominational control of a college in America. The reason for this control, like the reason for the requirement that the Rutgers College president (1766 as Queen's College) be Dutch Reformed, and the Columbia College president (1754 as King's College) by a contract with Trinity Parish, New York City, be Church of England, was to protect a minority religious body in the community.

The policy of a denomination legally controlling a college therefore began as a protective measure. Where a denomination was dominant such a legal safeguard was not considered to be necessary. A reason similar to that in which it originated will account for the later growth of the practice. In the first half of the nineteenth century founders of colleges often felt that they must erect a bulwark against the college being quietly captured by the religious infidelity which arose at the period of the French Revolution; there was also some fear of other denominations. To-day the strongest argument advanced by the defenders of the policy is that legal control by a church body or churchmen is a wise precaution against the introduction into the college governing board of men who under the guise of reconciling divergent opinions on minor matters will attempt to introduce a spirit hostile to the fundamental facts upon which historic Christianity rests.

Among the more prominent institutions legally under the government of their respective denominations are the following: University of Chicago (two thirds of trustees must be Baptists); Brown University (majority of governing boards must be Baptists); Colby College (majority of trustees must be Baptists); Bryn Mawr College (all of trustees must be Quakers); Haverford College (all of trustees must be Quakers); Northwestern University (majority of trustees must be Methodists); Syracuse University (majority of trustees elected by Methodist conferences); Boston University (two thirds of trustees must be Methodist); Vanderbilt University (election of trustees must be confirmed by Southern Methodist Education Board); Trinity College, N. C. (two thirds of trustees elected by Methodist conferences); Lafayette College (election of trustees must be confirmed by Presbyterian Synod); University of Wooster (trustees elected by Presbyterian synod, three quarters must be Presbyterians); Lake Forest College (election of trustees must be confirmed by Presbyterian synod); Queens' University, Kingston, Ont., (three quarters of trustees must be Presbyterians); University of Notre Dame (Roman Catholic Order of the Holy Cross); Holy Cross College, Georgetown University, and Fordham University (the Jesuit Order); University of the South (trustees are bishops of Episcopal Church and representatives of Episcopal dioceses); Kenyon College (majority of trustees are bishops of Episcopal Church and representatives of Episcopal dioceses). Also within the University of Toronto are federated colleges governed respectively by the Church of England and the Methodist Church.

The colleges of the Roman Catholic Church and of the Methodist Episcopal Church probably stand highest in the value of their properties and endowment, the institutions connected with the churches of the Northern Baptist Convention also having large resources. The Congregational churches and the several societies of Friends are smaller religious bodies possessing comparatively large educational establishments. The Reformed Church in America, and the Church of the United Brethren in Christ also control collegiate equipment which is large in proportion to their membership. On the other hand, very few colleges are connected by legal ties with the Protestant Episcopal Church in the United States. One reason apparently for this is the concentration of the educational energies of that church upon secondary schools. M. S.

COLLEGES, COEDUCATION IN. — See Women, Higher Education of.

COLLEGES, COMMERCIAL. — See Commercial Education.

COLLEGES FOR WOMEN. — See Women, Higher Education of.

COLLEGES, FOREIGN STUDENTS IN AMERICAN. — See Universities, Foreign Students in American.

COLLEGIATE CHURCH SCHOOLS. — If the cathedral churches furnished the most ancient and chief schools of Western Europe during the Middle Ages, some of the collegiate churches were not far short of them in antiquity, and were the main sources of supply of schools. In England the early collegiate churches like Beverley, Ripon, and Southwell in the North, Crediton and Twyneham, afterwards Christ Church, Hants, in the South, and Chester in the Midlands were perhaps either ex-cathedrals or created as secondary bishop's sees. Ripon, due to Wilfrid, and Crediton were certainly such. Southwell in Nottinghamshire was declared to have been an ancient archiepiscopal see of the Archbishop of York by the Commissioners who reported on it at its dissolution. Hence naturally these colleges have retained the schools which they had set up when they were cathedrals. The rest being colleges of secular canons, though the word "college" (*q.v.*) is of much later date, maintained schools in imitation of the cathedral churches on which they were modeled. The bulk of the early group is due to the tenth century. In England a large number of them owe their existence probably, like Warwick, to Edward the Elder and his sister Ethelfleda, the lady of the Mercians who established a chain of burgs, or fortified towns, as strongholds against the Danes, when they reconquered the Midlands and the North from them from 912 onwards. Oxford, Bridgnorth, Warwick, Bedford, Tamworth, Stafford, Leicester, Derby are all towns which these two so treated and which are found after the Conquest with ancient collegiate churches with ancient schools forming part of their foundation. Among those, imputed to Athelstan, who pursued the same policy, are Durham, afterwards changed to a monastic cathedral, Beverley Minster, and Bury St. Edmund's, the last afterwards changed into a monastery. Southwell Minster is attributed to King Edgar, or more correctly Eadgar, about 958. An era of monastery founding and conversion of churches of secular canons into monasteries followed. But sporadic collegiate churches were being founded right up to the Conquest, among the latest being St. Martin's-le-Grand, London, and Holy Cross, Waltham, founded by King Harold when earl in 1060. Now it is true that of all these in only two is there direct evidence of schools attached to them before the Conquest, Warwick and Waltham. At Warwick a royal writ of the year 1123 of Henry I, confirmed to the Church of All Saints the school of Warwick (*scolas Warwici*, the word "school" is nearly always in the plural up to the Reformation in formal documents) as it was in the time of King Edward, and in the days of his father and brother. At Waltham, a canon expelled to make room for regular canons in 1077, gives an account of the foundation by Harold, who imported a schoolmaster from Liège, whose son, also schoolmaster, taught the historian. But there is a great deal of indirect evidence of schools in many of these places as soon as records begin, not as new institutions, but casually as going concerns. If space permitted, numerous examples could be cited from France and Germany. It is enough to mention the collegiate church of St. Hilaire at Poitiers, at which Hildegard was teaching from 1024 to 1026, when Fulbert, Bishop of Chartres, summoned him there. The synodal decree of Pope Eugenius II, in 826, directing the establishment of teachers in all places where there was a necessity, no doubt included places where there were collegiate churches as being places where schools were necessary. In the twelfth century there are copious references to schools in many of the places mentioned, partly confirmations of the Norman lords, partly owing to the passion of the century for substituting regular for secular canons, the latter now parting with the control of their schools though not without a struggle. Thus at Christ Church, Hants, there appears in 1108 a confirmation to Hilary, dean and the canons of Christ Church, Twyneham, by the Norman lord of all their possessions, including the school of the same town, as they were granted to his father by Henry I, at the beginning of his reign. At Derby, on the other hand, the bishop confirms to the new abbey of Derby about 1153 their possessions, including the school of the same town as granted by William of the April Beard and himself. At Bedford, *c.* 1160, Nicholas, Archdeacon of Bedford, as a canon of St. Paul's there, in a document entered in the chartulary of the abbey of Newnham "confessed" that "Bedford School (*Scolas Bed.*) which I have held for some time with the consent of my fellow canons is of the right and appurtenant to St. Paul's, and therefore I have voluntarily resigned it to the regular canons of that church," who were afterwards moved out to Newnham.

The old collegiate churches were after the Conquest organized much like the cathedrals, with four principal persons instead of two. So we find at Beverley provost, precentor, schoolmaster, afterwards called chancellor, and sacrist or treasurer; and the schoolmaster appears about 1100 as the hero of a tale which results in St. John of Beverley miraculously curing him of his love for a pretty girl he had seen in church. In the fourteenth century, when its earliest chapter minute book begins, we find copious references to the grammar school, the chancellor appointing the master as usual, and the chapter confirming his monopoly of school keeping in their liberty, which extended for three leagues round the minster. The master had, it appears, the right of creating bachelors in the school. So at Ripon and Southwell as soon as the chapter books are extant the schools appear: the grammar school under the chancellor's, the song school under the precentor's patronage.

A good many new collegiate churches were created just after the Conquest, such as that at Hastings, where a collegiate church was founded in the new castle; and the grammar school was placed under one canon and the song school under another, who are named. At Pontefract it is not clear whether it was a wholly new creation, when, in the time of the first Norman Archbishop of York, a Lacy granted the school of Kirkby-Pontefract to the collegiate church of St. Clement in the castle which he had founded. There were not many additions made to the number of collegiate churches during the twelfth and the first half of the thirteenth century, the various new orders of Cluniacs, Cistercians, Augustinian canons, and friars being more in fashion. But about 1260 a revulsion in favor of the colleges of secular clergy took place, and thenceforward to the Reformation no quinquennium, perhaps no single year, passed without an addition to their number, — especially if we include, as we ought, the colleges (*q.v.*) at the universities, — and therefore to the number of schools. There was an even greater destruction of their records at their dissolution in 1547 than there was of the monasteries seven years before. But enough remains to show that whether we look to Howden in Yorkshire, founded about 1266, to Auckland in Durham, founded in 1283, to St. Thomas of Glasney in Cornwall at Penryn, founded or enlarged in 1267, to Ottery St. Mary in Devonshire, all foundations of bishops, or to Mettingham, Suffolk, founded in 1344 by John Walter of Norwich, to Stoke-by-Clare, Suffolk, founded in

1419 by Edmund Earl of March, to Fotheringay, founded in 1447 by Edward of York, or to Brecon College, founded by Henry VIII in 1542, in all of them we find a grammar school and a song school part of the foundation. Mettingham, it is true, seemed by 1404 to have discharged its duty vicariously by boarding scholars at Beccles to attend the school there. But this was exceptional. It may be assumed that where there are no statutes or accounts extant to prove the existence of the schools, they did not exist. The only difference between these later collegiate churches and the older ones was, that they were not as a rule endowed with such great estates. But that was chiefly because the early ones were endowed when land was still at prairie value. In these newer colleges the members were called chaplains or fellows instead of secular canons. The returns to the chantry commissioner at the dissolution in 1547 show that most of them did their duty of school keeping effectively. The Act of Dissolution provided for the continuance of the grammar schools of collegiate churches, and commissioners were appointed to assign lands out of the dissolved colleges for the support of the schools, and " meanwhile " to continue to pay the masters the stipends they were then receiving. Unfortunately some colleges were dissolved under the Monasteries Dissolution Act of 1540, which contained no such provision. Unfortunately also the treasury of Edward VI was in such straits that in the large majority of cases the " meanwhile " became always, the interim order was not followed by a permanent grant, and the stipends of £6 or £10 or £12 a year, which were not bad pay in 1547, by 1600 became meager, and by 1700 nothing. The accounts of the Crown revenues for the various counties show most of these payments duly made and the schools fairly flourishing up to the reign of Charles II, and some are still paid at the original rate. But of the two hundred or so collegiate grammar schools existing in 1547 few have survived to our day as efficient secondary schools. In some cases, later benefactors came to rescue. Most have either dwindled into elementary schools or exhibition funds in secondary schools, or have disappeared altogether. Thus while Christ Church, Hants, Waltham, Fotheringay, Stoke-by-Clare, and Mettingham schools have disappeared altogether, and some of the others which it would be invidious to mention barely struggle on, Beverley and Tamworth are doing modest work, not perhaps in the same relative position as before, but Ripon and Warwick and Derby are still flourishing on the same endowments as they enjoyed a thousand years ago. Leicester, with new endowments, is extremely successful as a local school, while Bedford, thanks to obtaining at the dissolution an endowment from lands belonging to a Carthusian monastery, the London Charterhouse, now flourishes in the forehead of the morning sky as one of the great public schools, with a girls' school equally successful, and second grade and elementary schools attached. But this single instance only emphasizes the loss which others suffered by not being reëndowed, as intended in 1547.

A. F. L.

COLLOQUIES, COLLOQUIA. — A term which Brinsley anglicizes in the plural as *Colloquiums*, applied particularly to Latin textbooks in dialogue form. Before the invention of printing, oral methods of teaching ruled supreme, and the conversational method was therefore a natural survival when textbooks were printed. The *Colloquia Scholastica* in Latin and Greek date back to Roman times. In the tenth century there is a *Colloquy* of Archbishop Ælfric (*q.v.*) and his pupil Ælfric Bata, consisting of conversations in Latin and Anglo-Saxon between the teacher and all sorts of people, such as the scholar, plowman, shepherd, hunter, fisher, merchant, shoemaker, smith, and so on, each describing his occupation.

Catechisms (*q.v.*) are a specialized form of the colloquy, namely, a dialogue between master and pupil with a view to the shortest and most exact exposition of the main points of the subject in matter of instruction. But the colloquy proper — the Renaissance and post-Renaissance colloquy — was the special method for direct early instruction in Latin speaking. The two classical works earliest taken in the grammar school were Cicero's *Epistles* and selections, and Terence's *Comedies* — because these formed suitable introductions to the phrases for familiar intercourse in Latin speaking. As early as 1528 Cardinal Wolsey, in his directions to the headmaster of Ipswich grammar school, required special attention to be paid to Terence, and in repeating the words of the speakers in the scenes, the boy was to be made to speak " with all possible correctness." But Cicero's *Epistles* and Terence's phrases in the plays were an incomplete equipment for Latin speaking. They required supplementing — firstly, because they contained much that was not essential for the earliest stages of Latin speaking, and secondly, and chiefly, because, being written with aims quite apart from the educational use of later ages, they did not contain the subject matter of the ordinary conversation of the sixteenth century; and if Latin was to become, as the Renaissance writers fervently desired and expected it to become, the universal learned language, it was necessary that fluency should be cultivated in school pupils, on all the topics likely to arise in all their daily life and pursuits, both in and outside the school. For this purpose the *colloquies* were written to remedy the defect, which it was impossible to supply from purely ancient classical sources. Further, though Latin speaking had prevailed in the medieval schools, it had degenerated too often into barbarous " dog-Latin," and it required a constant struggle of the Renaissance scholars to suppress the survivals of the old, incorrect vulgarisms, the *sordida verba*, which everywhere abounded. Accordingly the best scholars often turned their energies into providing *colloquia* in which correct Latin, founded as nearly as possible on the model of Cicero and Terence should be used. Hence the two *desiderata* of the *colloquium* were (1) correct Latin, so as to reform all ancient barbarous words and expressions; (2) familiar subject matter, so as to make the colloquy a really useful textbook, giving the Latin words and phrases to describe what was most needed in conversation, so as to bring pupils to the position of being not only pure, but also fluent Latinists. From the historical point of view, these considerations are now altered in order of importance. The colloquies are for us of prime significance because they reveal the details of the everyday life and environment of teachers and pupils, — school life, university life, as well as home life, — the interests of boys and girls, their relations to each other, their aspirations, their success and failure, their attitude to the academic, learned, social, religious, ethical, and even political atmosphere of their times. They may be regarded as valuable, educational historical documents.

The first of the series of Renaissance colloquies is the *Manuale Scholasticum*, composed between 1476 and 1481, containing dialogues between university students at Heidelberg. The most outstanding examples of collections of colloquies are probably those of Erasmus (*q.v.*), Petrus Mosellanus, Vives (*q.v.*), Castellion (*q.v.*), and Maturin Cordier (*q.v.*) (Latinized as Corderius). Erasmus' *Colloquia* (first edition 1519) have been read continuously since their appearance, because they abound in sly humor and recall the spirit of the times. Some of his colloquies seem rather devised for adults than for children or youth, but *Select Colloquies* have been edited for the schoolroom, even down to an edition which appeared in 1908 from the University Press, Cambridge, England, edited by G. M. Edwards. Moreover, Erasmus himself states that some of the colloquies were especially written by him for "backward pupils." The colloquies of Peter Mosellanus, called the *Pædalogia* (1518), though less well known than those of Erasmus, give a clever account of academic life, offering the conversations in Latin of students at Leipzig, giving graphic accounts of the "poor" students, almost at their wits' end to ward off starvation and getting the wherewithal to live and study by food from rich men's tables, by begging, or by awaiting the time of the great Fair, when merchants came from the locality of their homes bringing home supplies, or patron's subsidies. The recklessness of the students on receiving help — in at once spending lavishly on beer, and amusements, such as the circus — is vividly portrayed. The school colloquy was further developed by Vives (*q.v.*) in his *Exercitatio* (1539). He depicts, by boys' conversations, life in the home, the boy with his brothers and sisters at play, on the way to school, in school, and the topics interesting him there. All the surroundings of the boy's life find a place, the building of a new house and a tour in it from top to bottom, a cookshop and kitchen in the boy's town. There is a description of a royal palace, and an account of the prince's education (Philip of Spain, who afterwards married Queen Mary of England). A love of nature bursts out at times, as, for instance, in a horseback journey on a holiday. There is much humor, literary aspiration, the Renaissance spirit, but it is an inspiring boy's book. Castellion (*q.v.*) (Latinized as Castalio) published his *Dialogues Sacrés* in French and Latin in 1543. By this time the Protestant Reformers were intent on continuing the teaching of Latin with subject matter of a religious nature in accord with Reformation views. Castellion's *Dialogues* are entirely Scriptural in topic; the most important incidents of Scripture history are studied from the boy's point of view. The book was very popular, both on the Continent and in England. It was an excellent introduction to the Bible histories, and was written in good Latin. The *Colloquia* of Maturin Cordier (*q.v.*) (Corderius) was published at Lyons (1564), but was the product of Corderius' long schoolmaster's life in Paris, Bordeaux, Geneva, stretching over a period of sixty years' observation of boys. The *Colloquia* throughout describes schoolboys' life. It is the most comprehensive account of boys obtainable for the seventeenth century. They are mainly Genevan boys — but they stand for the Puritan boy throughout Europe. The *Colloquies* show in incomparable wealth of detail the action of Calvinism on the home and school life, and the reaction of its religious and ethical doctrines on boys' natures. They supply details of schoolmasters' aims and methods, and give a familiarity with the psychological aspects of teacher and taught. Though they disclose Calvinistic rigor, there is a love of children intermixed, for a parallel to which we must pass forward to Pestalozzi. The pictures which are presented of the various types of children gathered in the educational center of religious refugees at Geneva makes the book varied and valuable. It is unique in its presentation of the aim to transfer the idea of a theocracy into the school. It is not, perhaps, too much to say, that as a school textbook in English grammar schools, for the younger classes, Corderius' *Colloquies* was second only in its extensive use to the Bible and the Catechism, during the first half of the seventeenth century.

Colloquies were extant in the eighteenth and early nineteenth centuries, but the subject matter changed to general information, and elementary scientific instruction. They were written in the vernacular, and became scrappy and fragmentary. They lost the old interest of the sixteenth- and seventeenth-century type. The instructional side of the old colloquies was directed to the acquisition of Latin as a spoken language. The subject matter, therefore, was necessarily concerned with all that appealed to the interest, the humor, the surroundings, and the nature of the child. They therefore had a keen human side. In many ways, they afford suggestions for the direct teaching of language to-day, *mutatis mutandis*, and for the historical student, they disclose the subjects which were considered by experienced teachers to be of interest to the children of those centuries.

F. W.

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COLOMBIA, EDUCATION IN. — Colombia, republic, area about 500,000 square miles; population, 4,303,500. Capital, Bogota, population, 100,000.

By the constitution of 1886 the sovereignty of the former states of Colombia was abolished and the departmental system adopted, similar to that of Bolivia. The chief executive or governors of the departments (14 in number, law of Dec. 10, 1909) are appointed by the President. While the local administration is thus closely tied to the central authority, the departments have retained the independent management of their financial affairs. Although education has been officially recognized by the organization of a ministry of public instruction, on account of the repeated revolutions and general internal disorders, little progress has been made in the work of establishing public schools. Religious liberty is assured by the constitution, but the nation is Roman Catholic, and the Church and its auxiliary agencies, the teaching orders, have practically controlled education.

In 1906 public education was represented by a few primary schools in the cities, which are gratuitous and supported by municipal funds, and by normal schools in five departments maintained by departmental appropriations. Secondary education was conducted almost exclusively by church schools, which included elementary divisions. As a rule these schools are subsidized from the public treasury. The total attendance at the various schools and colleges was estimated to be about 219,000.

In the year to which the above statistics relate, *i.e.* 1906, the Minister of Public Instruction was authorized to formulate a plan for the complete reform of public education with a view to adapting it to the practical demands of the nation. The main provisions of the measure recommended by the minister and eventually adopted by both chambers of the legislature are as follows: "Primary instruction shall be maintained by public funds. It shall be gratuitous, but not yet compulsory. It shall be placed under the care and direction of the provinces, but subject to state inspection. Secondary instruction shall be in charge of the State, but the cities and the provinces may establish or subsidize secondary schools. Industrial and technical instruction shall be provided at the expense of the State in the federal capital and at the expense of the provinces in the other cities."

The committee reporting the bill emphasized its importance as follows: "It is in the schools, in the colleges, the technical institutes and in the workshops for training apprentices organized in accordance with rational methods and directed toward truly practical ends that we may find the germs of national elevation. To bring education into accord with actual necessities, that is to say, to propose as its aim some positive objects such as the exploitation and the culture of the immense territory of Colombia, or the development of the crude resources and of manufactures; this ought to be before all else the controlling principle of public instruction designed for a country which has been so long a victim of its taste for speculative studies, for theories, and for chimeras." These words express a pressing need not alone of Colombia, but of the other states which were included within the limits of the former Republic of Colombia when its independence of Spain was declared. At the present moment, then, the educational problem before the government is that of readjusting the traditional scheme of secondary education, since it is in the schools of this order that the directive classes are trained. The work of readjustment has already begun in individual colleges and in the normal schools that have been established in the most progressive departments.

Higher education was formerly represented at the capital by faculties of letters, philosophy, jurisprudence, and political sciences, on the humanistic side; and by faculties of natural science, mathematics, and engineering on the scientific side. The last named faculty is replaced by the mining school opened at Zipaquira. The faculty of natural sciences is continued as an adjunct of the faculty of medicine.

A. T. S.

COLONIAL EDUCATION. — See INDIA, EDUCATION IN; COLONIAL PERIOD IN AMERICAN EDUCATION; FRENCH COLONIES, EDUCATION IN; PHILIPPINE ISLANDS, EDUCATION IN; and the articles on the various colonial dependencies.

COLONIAL PERIOD IN AMERICAN EDUCATION. — The colonial period may well be called the period of transplanting; but with greater exactness, the period of transplanting ends about the middle of the eighteenth century. By that time there has begun reconstruction of the educational system to meet a new social consciousness. For detailed treatment of the educational history of the several colonies, the reader is referred to the accounts of the respective state systems given under the names of the thirteen original states. Here we are concerned with comparisons among the colonies and with topics more or less common to the region as a whole.

Foundations in English Legislation. — England had no specific educational legislation of a kind to influence the colonies. But by 1601 there had been developed, especially in poor relief laws and apprenticeship legislation, certain principles of law from which colonial legislation on education takes its departure. It has been estimated that in the time of Elizabeth about one half of the population of England had not sufficient income to supply actual sustenance. To meet this situation, a series of acts, culminating in 1601 (43 Eliz., *c.* 2), were passed designed to regulate the labor of the poor and to fasten upon the rich the necessary poor relief. The following provisions in these acts, as will be seen, influenced American school legislation. (1) The compulsory apprenticeship of all youth not of independent living; (2) the obligation of the master to train his apprentices in his trade; (3) the obligation upon the overseers of the poor to supply, wherever necessary, the materials and opportunity for this training, pay the apprenticeship fee, for example; (4) compulsory assessment of rates on all ratable persons to provide the funds necessary to these ends; (5) The excessive burden of any one parish may be shared by others of the hundred or the county. The significance of these for education appears especially in the recognition of the rights of the State, first, to give needed training to the poor youth by assessed rates upon all, and, second, to distribute the excessive burden of one parish throughout the hundred or county.

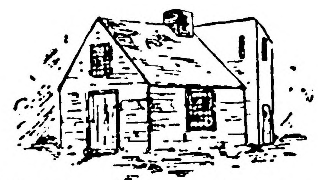
In this connection it is well also to point out the evolution of compulsory assessments for poor relief: (1) voluntary contributions (1553); (2) voluntary contributions, if possible, forced, if necessary (1563); (3) assessment, if desired by local authorities (1572); (4) compulsory assessments of all ratable persons (1601). These principles and methods of procedure, as developed just prior to the period of colonization, form the basis of colonial legislation in the more distinctive field of education.

Educational Legislation in Virginia. — The first founded of the colonies, Virginia remained throughout the colonial period in mental attitude most like the mother country. The general legislative enactments refer either to William and Mary College, on the one hand; or, on the other, to orphans, or to the poorer classes. The English spirit is evident. In this, Virginia stands among the colonies as the clearest example of one type of attitude toward school support and control. In 1643, orphans are to be educated " according to the competence of their estate." In 1646, " if the estate be so meane and inconsiderable that it will not reach to a free education, then that orphan (shall) be bound to some manuall trade. . . . except some friends or relatives be willing to keep them." In an act of 1660–1661 the English precedent is explicit. The example is invoked of " laws and statutes by act of Parliament . . . for the education of youth in honest and profitable trades." " To avoid sloth and idleness . . . as also for the relief of parents whose poverty extends not to giving (their children) breeding . . . the justices of the peace should . . . bind out children to tradesmen or husbandmen to be brought up in some good and lawful calling." Since some parents object to this, it was provided that the " commissioners of the several counties . . . make choice of two children in each county . . . (to) be sent to James City . . . to be employed in the public flax houses under such masters and mistresses as shall be appointed." It was further deemed " fit that the commissioners have caution not to take up any children but from such parents who by reason of their poverty are disabled to maintain and educate them." The presence is to be noted here of all five of the English provisions pointed out above: compulsory apprenticeship of the poor, training in a trade, obligation of public authorities to provide opportunities for this education, both local and general funds used, — all, as the act states, " according to the aforesaid laudable custom in the Kingdom of England." In 1705, " the master of the (apprenticed) orphan shall be obliged to teach him to read and write "; a provision that Massachusetts, breaking from England, had made for all children some sixty years before. But in Virginia the indifference of the mother country to popular education was continued without change. As in England, the controlling influences were aristocratic; and diversities of population forbade free social commingling. Moreover, had a common school system been desired, the large plantations " with houses far asunder," would all but have prevented it. Tutors and small private schools, or education in England, prevailed for the better to do. The less fortunate were left to their own devices. Virginia stood as the type of the *laissez faire* policy with reference to the support and control of public education.

Educational Legislation in Massachusetts. — The opposing type is Massachusetts, the best example of governmental activity in school matters. Here two elements commingle: on the one hand, the common heritage of English law and procedure; on the other, the religious consciousness of extreme Protestantism. (See CALVINISM AND EDUCATION.) In whatever countries this religious attitude had been present, the leaders had included in their scheme of reform some conception of general education. It need not then be cause for surprise to find this Puritan ideal early seeking embodiment in legal form and principle that is English in its origin. This step appears in the act of 1642, which is, on the whole, a Puritan adaptation of the English laws already reviewed. " The neglect of many parents and masters in training up their children in learning and labor " is the occasion of the law. " The chosen men," as the English overseers of the poor, " charged with the redress of this evil," are empowered " to put forth (as) apprentices the children " of all who are " not able and fit to bring them up." " They are also to provide a sufficient quantity of materials as flax, hemp, etc. . . . for working out the same." In this American reproduction of the English apprenticeship law are repeated, explicitly or implicitly, four of the five English provisions already noted. But to them is added that significant contribution of the Protestant religious consciousness: the chosen men in their oversight of the children shall " take account . . . especially of their ability to read and understand the principles of religion and the capital laws of this country." For the first time in the English-speaking world does a competent legislative body require that all children shall be taught to read. Out of the English poor law, America takes its first step toward state control of education. The act does not establish schools; and the religious motive is to be left behind in educational progress; but the gain to education is accomplished, and the future is to build on it.

The act of 1647 comes next. To base it, even in part, on English poor law seems hardly warranted. Nor does the 1642 act of itself furnish a sufficient foundation. The religious consciousness is uppermost: " It being one of chief point of that old deluder Satan to keep men from the knowledge of the scriptures." The schools are primarily for the clergy, that they may have " the use of tongues," and so avoid the " false glosses of saint seeming deceivers." Back of the act may be safely assumed the general example of European Protestantism. There has as yet been adduced no proof that the *First Book of Discipline*, or other Scottish educational activity, had any determining influence. However much education is again indebted to religious zeal, its gain remains assured. " Every township of fifty householders . . . shall . . . appoint one within their town to teach all such children as shall resort to him to read and write. . . . Where any town shall increase to the number of one hundred families or householders, they shall set up a grammar school, the master thereof being able to instruct youth . . . for the university." A second great step is now taken. Not only is a school system built; but for the first time in the English language is there a legally valid assertion of the right of the State to require of local communities that they establish and maintain schools of general learning. The " commonwealth " is mentioned along with the " church " as a beneficiary of the act. In the light of subsequent development it can safely be said that these two Massachusetts acts of 1642 and 1647 laid the foundation of the American public school system.

School Rates in Massachusetts.—This method of school support is closely connected in its rise with the act of 1647, and is hardly less significant. There was, in the case of English poor relief, an evolution from voluntary contribution through compulsory contribution to rate assessment. The same evolution in the case of the support of the ministry and of the schools took place in Massachusetts. In 1634 the towns were authorized to use rates for all public charges. The application of this, however, to the support of the ministry was by some objected to on theoretical grounds; while its application to the schools was as yet too novel to gain an early acceptance. In the case of the former, Salem shows concisely the three steps of the evolution: 1639, " a voluntarie towne contribution towards the maintenance of our ministry "; 1657, " all those persons that will not subscribe nor contribute towards the mayntenance of the ministry shalbe rated and the selectmen to rate ym "; 1659, " ordered that those sumes for the ministry shall be raised uppon the town by way of rate." In the case of school support, the 1647 act bears specifically. The schoolmaster's " wages shall be paid them by the parents or masters of such children, or by the inhabitants in general . . . as the major part of those that order. the prudentials of the town shall appoint." The towns may choose, and every possible arrangement appears in the records. The necessity of the care of the poor in these schools forced upon the town some part of the schoolmaster's salary. The penalties attending any disregard of the 1647 act made the town, at times, painfully conscious of its responsibility. These two elements as spurs to the democratic sense of the community probably account for the universal acceptance of the tax levy as the proper means of school support. Dr. Jackson's exhaustive study of twenty-one towns, for which records are available, shows, among other things,



School House & Watch House 1648.

Dedham, Mass.

(1) that of the six towns whose records of support antedate the 1647 act, all but one are, when the records begin, using the method of contributions, at least in part. (2) That the custom was in Boston and other towns at a later date (1645) to pay "the yearly charge of the school by contribution either by voluntary allowance, or by rate of such as refused" (Winthrop's history). (3) That by 1764 under the pressure of the penalties of the 1647 act only one of the towns studied was still using tuition. (The median date of rate adoption was 1715.) Rates and other publicly derived funds had supplanted all other means of school support. When it is recollected that England did not, until the latter part of the nineteenth century, assume the responsibility of furnishing education free to all, we can the better recognize the significance of this achievement of colonial Massachusetts.

Church School Systems in New York and Pennsylvania. — The Dutch in New Netherland, New York, and the Germans of various sects in Pennsylvania brought with them to America a school tradition and custom so different from those previously studied in Virginia and Massachusetts as to constitute a third type of attitude toward the problem of school control and support. The Quakers developed much the same system both in Pennsylvania and elsewhere, and will accordingly be included in the same discussion. The characterizing feature of this type is found in the close connection between the Church in its organic capacity and the school. The New Netherland schoolmasters sent out by the West India Company were first certificated by the Reformed Dutch Church authorities in Amsterdam. The public schoolmaster in New Netherland held *ex officio* the positions of reader (*voorleser*) and precentor (*voorzanger*) in the particular church with which the school was connected; and "in case of the sickness or absence of the minister . . . must read a sermon for the edification of the congregation." The common prayers and the catechism formed part of the school curriculum. When, in 1771, the Reformed Dutch churches in America formed an assembly of their own, it was reënacted that "the respective congregations shall hereafter make it their business to establish schools . . . under the direction of the consistories"; and "everywhere the consistories shall see to it that there are good schoolmasters. . . . "

Substantially the same seems to have been true of the Pennsylvania Germans. It appears from the records of the Lutheran churches in Pennsylvania that "each congregation . . . established a congregational school alongside of the church, at the earliest possible period after its formation." And the same appears to have been true of all the other sects. The closeness of the connection between church and school may be inferred from a 1747 contract: "I, the undersigned John Hoffman, parochial teacher of the church at Lancaster, have promised in the presence of the congregation to serve as chorister, and as long as we have no pastor, to read sermons on Sunday. In summer I promise to hold catechetical instruction with the young, as becomes a faithful teacher, and also to lead them in singing and to attend to the clock." While the ecclesiastical machinery of the Quakers was not so strong as that of the other sects, their interest in parochial education was not less active. In 1722, at the yearly meeting of Friends for the Province of Pennsylvania and New Jersey, it was set forth that "Our advice is that all Friends' children have so much learning as to read the holy scriptures and other English books, and to write and cast accounts . . . and for that end let the rich help the poor." In 1746: "We desire you, in your several monthly meetings to encourage and assist each other in the settlement and support of schools"; and this is many times repeated in subsequent years. See FRIENDS, EDUCATIONAL WORK OF.

When it is recalled that in 1760 out of a total population of 250,000 in Pennsylvania, the Friends were estimated at 50,000 and the Germans at 90,000, the part played by these parochial schools is the better appreciated. In respect of centering attention on an elementary education of the three R's instead of preferring grammar schools, as was done for the most part elsewhere, and in respect of educating girls as well as boys in these schools, it might readily be admitted that to this type belongs the credit for approaching at this early date most nearly to the modern idea of an elementary school. But this does not mean that the American public school came from this source. Not only does the history of the present public schools show another origin; but it must be admitted that in Pennsylvania at least the parochial system by its positive opposition delayed the acceptance of the public school idea.

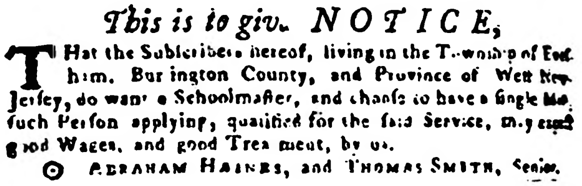
General Characteristics of the Colonial Systems. — Maryland may be considered as presenting a fourth type proposed but not developed, that of a county system of free schools supported by general colonial taxation. The colonies not already considered group themselves about one or the other of these types. Connecticut and New Hampshire follow the example of Massachusetts. Rhode Island, New York, New Jersey, Delaware, and North Carolina follow the English attitude as exemplified by Virginia. South Carolina's legislative history, had it been followed in practice, would have given a fifth type, namely, the legislative establishing of a system of parish schools. In 1712 appropriations were offered toward building a schoolhouse in each parish under the direction of the established church (the Church of England), and for a schoolmaster's salary.

Apparently little was done in response to the offer. Afterwards, in 1722, a system quite similar to that of Maryland (1723), was authorized. The justices of the several county courts were to establish a "free school" (Latin grammar) in each county and precinct, levying a local tax to pay for the schoolhouse, while the state offered a salary of £25 for the schoolmaster. But this too came to nothing. In practice, South Carolina followed closely in the footsteps of Virginia. Georgia, founded much after all the others, and long unprosperous, enjoyed the unique experience of having the Parliament of England provide the colonial budget, including the salaries of two schoolmasters. This was continued until the Revolution.

Thus in colonial days were laid the foundations of the present American public school system. The following principles not previously explicit in English practice were embodied in actual systems prior to the Revolution: (1) The right of the State to require the education of all its citizens (Massachusetts, 1642). (2) The right of the State to compel local civil divisions to establish schools (Massachusetts, 1647). (3) The right of the local civil division to support schools of general education by a tax levy on all ratable persons (Massachusetts practice, practically universal prior to 1750). (4) The right of the State to appropriate state funds to a general system of schools (Maryland, 1694).

The Schools from Within. — We turn now from the administration of colonial education to the schools themselves. In England, at the time of the colonization, three distinct schools divided what are now considered the fields of elementary and secondary education: the petty (dame) school, teaching spelling and reading, and less often writing; the grammar school, which taught Latin and Greek "grammar"; and the writing school, in which the boy studied writing and "arithmetic or merchants' accounts." The curricula as here given were not invariable. The types, however, were fixed. Brinsley (*q.v.*) complains that the grammar school was often "troubled with teaching A B C," while a boy could depend on the incidental writing of the grammar school and not attend the writing school. In such case he might reach the university scarcely able to tell the numbers of pages or read the dates of chronology. The grammar school was the important school. The petty school either prepared for it, or gave a modicum of training to those who were not to be liberally educated. The writing school, tending to be commercial in its outlook, was parallel to the grammar school. In London grammar pupils usually went "at eleven and five o'clock to the writing schools." In the country itinerant masters taught writing in the grammar schools.

These three schools were brought to America, but owing to the exigencies of a new country, were not often found distinct. Until 1750, wherever the parochial or town schools did not prevail, the grammar school was the principal concern of educators and school legislation. The writing school is seen in the identical resolutions of Boston and Braintree, 1682 and 1683, respectively, to establish "one or more Free Schools for the teaching of children to write and Cypher."



This is to giv. NOTICE,

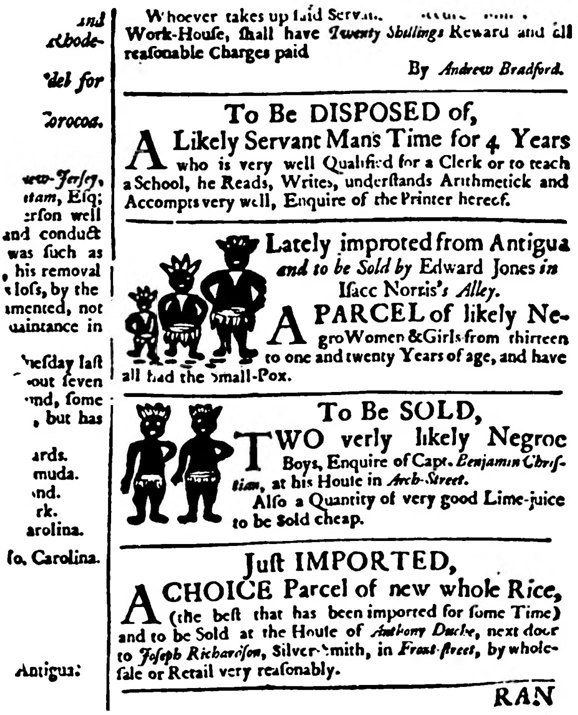
THat the Subſcribers hereof, living in the Townſhip of Eveſham, Burlington County, and Province of Weſt New-Jerſey, do want a Schoolmaſter, and chooſe to have a ſingle Man. Such Perſon applying, qualified for the ſaid Service, may expect good Wages, and good Treatment, by us.

ABRAHAM HAINES, and THOMAS SMITH, Senior.

Advertisement of a Colonial School, from the *Pennsylvania Gazette*, November 22, 1759.

Each town already had a grammar school. An early record of the dame school is in Springfield, 1682, where "Goodwife Mirick" is "teaching children to read" at "three pence a week for every child." Before this at Newbury in 1653, the petty school is implied in the record that pupils attend the "free school" "so soon as they know their letters and begin to read." In Brookline, where in 1710 there was no grammar school, the town determines on both the other types, "a good dame" (evidently to teach reading), and a "Master" "to teach to write and Cypher." The same year in Charleston, S.C., in addition to the "master" of the "free school," a "fit person" was to be appointed "to teach writing, arithmetic, and merchants' accounts," a combination of types which the Maryland acts contemplated. In the greater number of cases there is seen a tendency to combine two or more of the types so that one master could meet the more insistent demands. In the two decades in New England immediately following the 1647 act the schools most frequently found are (1) those that teach reading and writing, and (2) a grammar school which gave instruction also in reading, writing, and ciphering. Later than this the elementary school takes up the ciphering and becomes the school of the three R's, a curriculum which was more frequently in the Dutch, Quaker, and German schools. In the reading school, the first book might be a hornbook (*q.v.*), or quite probably a primer. There were many primers, of which the New England was the most common. The second book was usually the psalter, and then came the Testament or Bible. The newspapers regularly advertise, "Testaments, Psalters, and Primers." In arithmetic, for most of the colonial period, the master commonly dictated "rules" and "sums," these forming a MS. arithmetic, many of which have come down to us. Later, textbooks, such as Fisher's, Hodder's, Cocker's, and Dilworth's, were increasingly used. English grammar, history, and geography were not taught till the latter part of the colonial period, when the educational outlook begins to change.

The grammar school took the boy at about the age of eight. The first book was the *Accidence* from which the declensions and conjugations were learned. Cheever's book was the most popular, though Brinsley's and Hoole's were also used. The second book might be the *Confabulatiunculae Pueriles*, Cato's *Distichs*, or the colloquies (*q.v.*) of Corderius, Vives, or Erasmus (*qq.v.*). Castellion's (*q.v.*) *Dialogi Sacri* was frequently used. Lily's grammar would follow Cheever. The authors read varied much, but the aggregate differs little from a modern list. Much attention was paid to writing Latin, for which Clarke's *Introduction* was much used. Versemaking did not thrive on American soil. The speaking of Latin was demanded · theoretically. At the grammar school of William and Mary the rule was for the pupils " at all times to speak Latin in apt and proper terms," even in "any sort of Plays or Diversions." It may safely be supposed that such efforts were not usually successful. In Greek the grammar was studied, usually Camden's or the Westminster. The New Testament was read, and sometimes Xenophon or Homer or Isocrates. The Massachusetts law of 1647 required the grammar schools of that colony " to instruct youth so farr as they may be fited for ye university "; the aim of the New England grammar school may therefore be inferred from the Harvard entrance requirements (1642). " When any Scholler is able to read Tully or such like Latin Author extempore and make and speake true Latin in verse and prose without assistance, and decline perfectly the paradigms and nounes and verbes in ye Greeke tongue, then may hee bee admitted into ye College, nor shall any claime admission before such qualifications." (See College Requirements for Admission.)



Whoever takes up ſaid Serv... [illegible] Work-Houſe, ſhall have *Twenty Shillings* Reward and all reaſonable Charges paid

By *Andrew Bradford.*

To Be DISPOSED of,

A Likely Servant Mans Time for 4 Years who is very well Qualified for a Clerk or to teach a School, he Reads, Writes, underſtands Arithmetick and Accompts very well, Enquire of the Printer hereof.

Lately improted from Antigua *and to be Sold by* Edward Jones *in* Iſacc Norris's *Alley.*

A PARCEL of likely Negro Women & Girls from thirteen to one and twenty Years of age, and have all had the Small-Pox.

To Be SOLD,

TWO verly likely Negroe Boys, Enquire of Capt. *Benjamin Chriſtian*, at his Houſe in *Arch-Street.*

Alſo a Quantity of very good Lime-juice to be Sold cheap.

Juſt IMPORTED,

A CHOICE Parcel of new whole Rice, (the beſt that has been imported for ſome Time) and to be Sold at the Houſe of *Anthony Duche*, next door to *Joſeph Richardſon*, Silver-Smith, in *Front-ſtreet*, by wholeſale or Retail very reaſonably.

RAN

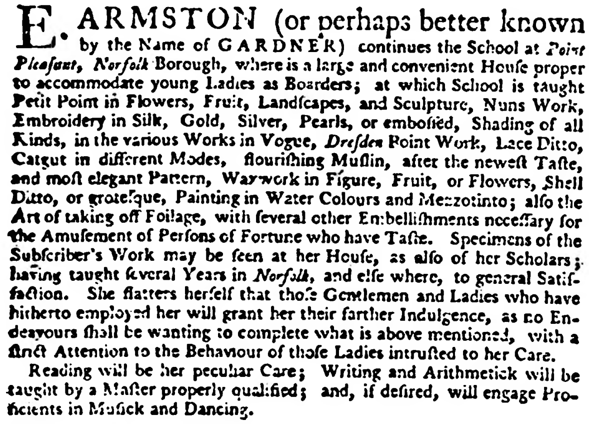
A Type of the Colonial Schoolmaster : from the *American Weekly Mercury*, Philadelphia, 1735.

In the Middle and Southern colonies commercial demands early made themselves felt. Chaplain Sharpe complains in 1713 of New York that the people are " so inclined to Merchandise that they generally seek no other education for their children than writing and arithmetic." Already (1712) Charleston, S.C., had provided in its free school "or academy " " a fit person " " to teach writing, arithmetic, and merchants' accounts, and also the art of navigation and surveying and other useful and practical parts of mathematics." The New York " Public School " of 1732–1739 advertised to teach "all the Branches of the mathematics, geometry, algebra, geography, navigation, and merchants' book-keeping." These are the forerunners of the new era to be ushered in by Franklin's Academy of 1749. (See Academies.)

Everywhere and at all times in the colonial period the religious element was prominent in the schools. Reference has been made to the use of the Psalter and Testament as textbooks. The primers were filled with the religious ideas of the time. Every school taught the catechism. Not only did the parochial schools require church attendance of their pupils, but the grammar schools as well compelled their pupils to report each week on the Sunday sermon.

Many of the schoolmasters were men of considerable worth. Francis Daniel Pastorius of Germantown was probably the most learned, as Ezekiel Cheever (*q.v.*) was the most famous. Christopher Dock (*q.v.*), the Mennonite, wrote in 1750 the first American book on school management. During the eighteenth century suitable schoolmasters were hard to obtain. Tutors for the wealthy families of Virginia and the South were generally brought from England and Scotland; toward the Revolution from the North. Many of the ordinary teachers in the Middle colonies and Virginia were probably servants. The Society for the Propagation of the Gospel (*q.v.*), wherever it operated, furnished an excellent body of schoolmasters. Some of the towns about New York City particularly profited by them.

Education of Girls. — It will be evident that in the opinion of colonial America learning did not properly belong to women. Reading was demanded, writing desired, a little arithmetic might be studied. Beyond this woman seldom went. As has been said, the parochial schools were generally, perhaps invariably, open to girls. The Penn Charter School from the first (1698) admitted " all children and servants, male and female"; and this seems to have been the rule with the Quaker schools. The curriculum is shown in the official wish (1772) that "all Friends' children have so much learning as to read the holy scriptures . . . and . . . to write and cast accounts . . . and . . . some useful . . . employment." To what extent this wish was realized in the case of girls we have no means of knowing. Among the Germans it was likewise the rule for girls as well as boys to attend school. Christopher Dock arranges a class, "the boys together on one bench and the girls on another by themselves." His curriculum is spelling, reading, writing, and ciphering. The Moravians under Count Zinzendorf in 1742 opened a boarding school of 25 girls at Germantown; and in 1749 another for older girls at Bethlehem. This latter school is now in existence, probably the oldest girls' school in America. The average attainment of the German girl may be inferred from a statement made in 1789 by Dr. Rush: "There is scarcely an instance of a German of either sex in Pennsylvania that cannot read; but many of the wives and daughters of the German farmers cannot write."



E. ARMSTON (or perhaps better known by the Name of GARDNER) continues the School at *Point Pleaſant, Norfolk* Borough, where is a large and convenient Houſe proper to accommodate young Ladies as Boarders; at which School is taught Petit Point in Flowers, Fruit, Landſcapes, and Sculpture, Nuns Work, Embroidery in Silk, Gold, Silver, Pearls, or emboſſed, Shading of all Kinds, in the various Works in Vogue, *Dreſden* Point Work, Lace Ditto, Catgut in different Modes, flouriſhing Muſlin, after the neweſt Taſte, and moſt elegant Pattern, Waxwork in Figure, Fruit, or Flowers, Shell Ditto, or groteſque, Painting in Water Colours and Mezzotinto; alſo the Art of taking off Foilage, with ſeveral other Embelliſhments neceſſary for the Amuſement of Perſons of Fortune who have Taſte. Specimens of the Subſcriber's Work may be ſeen at her Houſe, as alſo of her Scholars; having taught ſeveral Years in *Norfolk*, and elſe where, to general Satiſfaction. She flatters herſelf that thoſe Gentlemen and Ladies who have hitherto employed her will grant her their farther Indulgence, as no Endeavours ſhall be wanting to complete what is above mentioned, with a ſtrict Attention to the Behaviour of thoſe Ladies intruſted to her Care.

Reading will be her peculiar Care; Writing and Arithmetick will be taught by a Maſter properly qualified; and, if deſired, will engage Proficients in Muſick and Dancing.

A Colonial School for Girls: from the *Virginia Gazette*, March 5, 1772.

In New Netherland, while the data are not very explicit, the evidence is strong that girls as well as boys attend the church schools. A widow, upon a remarriage, signed in 1642 the usual marriage contract "to keep them [four girls and a boy] at school, to let them learn reading, writing, and a good trade." The words "reading, writing, and a good trade" occur over and over again in similar contracts and in wills, sometimes referring to girls alone, sometimes to boys alone, sometimes, as here, to both. Sometimes, when a girl is named alone in one of these contracts, sewing is added. Unfortunately, however, we again cannot suppose that writing was an invariable accomplishment. The signatures of women that have come down to us from the Dutch period show a large number of marks made. It is interesting that the only public school of colonial New York City open to "children of what age and sex soever" was one which followed and continued "the city school" of New Amsterdam. It is unfortunate, but significant, that public support of a coeducational and municipal school could not long survive in the new situation of English control.

In New England all children must learn to read (act of 1642); but women should (Governor Winthrop) attend to "household affairs" and not "meddle in such things as are proper for men whose minds are stronger." These doctrines are explicit in the Hartford court decision of 1655 that certain administrators should "educate the children, learning the boys to read and write, and the daughters to read and sew." This discriminative precedent is followed in other court decisions and in legal apprenticeships. The discrimination appears also in the schools of the period. The New Haven Hopkins Grammar School states the rule for the others of its kind: "that all girls be excluded as Improper and inconsistent wth such a Grammar School as ye law injoins, and is ye Design of this settlem^{t}." With regards to those lesser masters' schools which taught the three R's, the same rule held on the whole. The exceptions were until late in the period confined to the small towns: Hampton, N.H. (1649), Rehoboth, Mass. (1689), and Manchester, Mass. (1724) admit "both sexes of girls and boys to read English, write and cast accounts." Just how many towns did allow girls to attend such schools cannot be determined from the available data. But evidently the number is small. Of some two hundred towns whose records have been studied by Small and others, the present writer can find only eleven which admitted girls prior to 1770. And some of these may have been dame schools, which of course were always open to girls. Some masters' schools, however, began to admit girls without formal action on the question. Thus at Hartford we find no recorded vote to admit girls; but the school lists show in 1695–1699 no girls; in 1700, 4 girls out of 46 pupils; in 1709, 16 girls out of 64 pupils. After the eighteenth century is well open and dames begin to teach the town schools, it becomes more and more the custom for girls to attend the public schools; especially in the country. In the larger places the admission is halting. In 1766 Medford orders its master to "instruct girls two hours a day after the boys are dismissed." And such expedients to teach girls at odd hours and apart from boys become frequent.

For the general condition of girls in the average country schools at the close of the period the statement of Woodbridge as to what he knew personally of rural Connecticut about 1770 may be accepted. "Common schools were open to every child." "Girls had no separate classes, though usually sitting on separate benches." "The branches taught were spelling, reading, writing, and rarely even the first rules of arithmetic. I have known boys that could do something in the four first rules of Arithmetic. Girls were never taught it." The wife of John Adams (born 1744) probably speaks of a situation somewhat above the average. "Female education, in the best families, went no further than writing and arithmetic; in some few and rare instances music and dancing." Our records for the other colonies are too few to allow extended discussion. In the matter of apprenticeship the English custom seems to have prevailed. An orphan's court in Virginia (1694) stipulates in the case of a girl bound out that the master is "to teach her to read, sew, spin, and knit." The ordinary neighborhood reading schools seem to have been open to girls. The S.P.G. schools, whose curriculum was reading, writing, and ciphering, mention girls, as if customarily present. Of Rowland Jones' pupils (1725) "one girl exceeded all; she had . . . by heart . . . the whole book of St. John." In 1738 Whitefield opened "for the Girls of Savannah" what appears to have been a charity school. Aside from private schools conducted for gain, this was one of the first, if not the first school exclusively for girls in the colonies. The grammar school everywhere excluded girls.

In the education of the wealthy girls who looked forward to social life, most numerous in Virginia and South Carolina, probably the English customs prevailed alike throughout the colonies. Hugh Jones says (1724) of Virginia, "as to the education of girls, it is great Pity but that good Good Boarding schools were erected for them at Williamsburg and other towns." At the same time a girl from the Barbados learned in Boston "to sew, fleure, write, and dance," apparently, however, not at a boarding school. Later, boarding schools were opened in practically all the colonies. Probably in most cases the daughters of the wealthy were taught at home. The tutor for the boys of a family taught the girls reading, writing, arithmetic, and literature (now so called). Special masters taught music and dancing. An Occasional English governess was brought out. Even wealthy mothers oftentimes taught their own daughters. While Charles Cotesworth Pinckney and his brother Thomas were at Oxford and Westminster, their sister was studying in Charleston under their mother: "Harriott pays her comp^{ts}; she is much engaged just now with geography and musick." In rarer instances girls were sent to England for their education. William Byrd of Virginia has abroad, at one time (1686 sq.), one son and two daughters. The close of the colonial period shows signs of a new attitude. In fact, a new era dawns at Portsmouth, N.H., in 1773, when the town supports a "Female School." Some eighty girls, from seven to twenty years of age, study reading, writing, arithmetic, and geography. Already the American interest in the education of women is beginning to make itself felt.

For more detailed discussion of aspects of this topic see the account of education in each of the thirteen original states, also articles on ACADEMIES; CALVINISM AND EDUCATION; GRAMMAR SCHOOLS; COLLEGE, AMERICAN; COLLEGE REQUIREMENTS FOR ADMISSION; WOMEN, HIGHER EDUCATION OF.

The Close of the Period. — Toward the close of the colonial period there comes a change of attitude in America. The original religious solidarities, whether of Puritan New England or of the Episcopal South, tend to be broken up. Presbyterian Scotch and Irish enter in great numbers into the Middle and Southern colonies. The "great awakening," under Whitefield and Edwards, brings a more democratic spirit into church affairs, especially in New England and the middle region. Moreover, the colonies are now old enough to have their own history and tradition. Braddock's defeat points a moral. From it all arises an American consciousness. Customs and institutions that prevail in Europe no longer for that sole reason satisfy. The tide of individualism rising throughout Christendom finds in America a more plastic situation, and accordingly a readier acceptance. The schools reflect the general spirit of the times. In New England, compulsory maintenance of schools — originally imposed by the clerical oligarchy — finds greater difficulty of enforcement. Various devices avoid the increasing penalties. The single township school taught by the master gives way either to the "moving school" (*q.v.*) or to several neighborhood schools taught by dames (*q.v.*). This marks the approach of the district system (*q.v.*), aptly rated as "the low water mark of New England education." The reading and writing schools now become one to meet the general demand of the people and reach out toward the present first place of the elementary school in American education. The (Latin) grammar school, unsatisfactory for its narrowness alike of curriculum and patronage, begins to give way to the more democratic academy (*q.v.*). Franklin's academy scheme of 1743 gives best formulation to the most advanced opinion of the time, and is indeed still ahead even of American progressiveness. In higher education the same spirit of innovation is seen in the founding in 1754 of King's College, now Columbia University (*q.v.*), and the next year of the College of Philadelphia, now University of Pennsylvania (*q.v.*). Both manifested a sympathy for immediately practical studies thitherto unknown among colleges. Their advertised schemes were visionary in their comprehensiveness; and the actual practice differed little from the customary; but the change of attitude was unmistakable. There was evident intent to make conscious adaptation to the present felt needs of everyday life and endeavor.

The close of the colonial period thus shows a real abandonment of the identical transplanting of European schools and curricula. The spirit of adaptation has set in. American education as a distinct type is already in the making. P. M. and W. H. K.

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COLOR. — A term popularly applied to any light sensation whatever. In science, however, it is limited to the chromatic qualities of light sensation, as distinct from the achromatic qualities, or gray. White light (achromatic) may, indeed, by being passed through a prism, be exhaustively analyzed into constituent color elements — red, orange, yellow, green, blue, indigo, violet (rainbow colors), and the intervening qualities. Although white light is as a sensation simple, it is as a physical phenomenon complex. Its constituent elements obtained in the way just mentioned are known as the pure, spectral, or monochromatic colors. Most of the colors, as we see them in nature or in objects of ordinary use, are not pure. They are usually obtained by the transmission of white light through a more or less transparent substance, such as "colored" glass, or by reflection from a surface. In these cases the object transmits or reflects only certain constituent rays of the white light which give some one predominant color tone rather than another; but few such objects yield spectrally pure colors. A given color may be defined, physically, by giving the frequency, the amplitude, and the form of the ether vibrations producing it, and, psychologically, by stating its quality, hue (*q.v.*), or tone (*e.g.* red, yellow, blue), its brightness (*q.v.*) or intensity (*q.v.*), and its saturation (*q.v.*). R. P. A.

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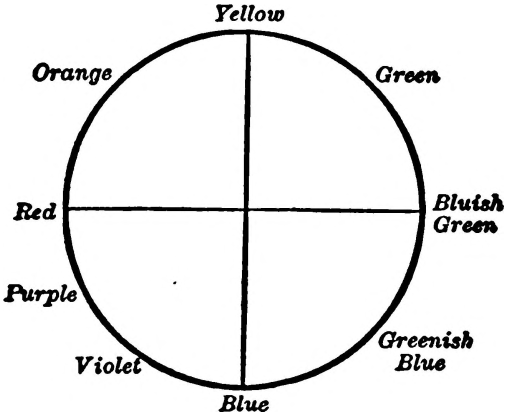
COLOR AND HEARING. — See Conæsthesia.

COLOR BLINDNESS. — A term applied to the inability to distinguish certain colors as such. It is usually congenital, and, if so, is incurable. It may, however, be caused by disease or accident affecting the visual apparatus. The rarest and most complete cases of color blindness involve the total absence of all color sensation. This is known as total color blindness, and is usually accompanied by painful sensitiveness to ordinary daylight. The objects which to normal beings appear colored would to such an individual doubtless appear gray. His visual world would, therefore, be one of different intensities of gray. The other types of color blindness are called partial color blindness, and of these the most frequent form is red-green color blindness. A person with red-green color blindness makes no distinction in color quality between all the spectral colors from red to green. In other words, by proper variation in the intensity of any two of these colors, such a person could obtain a perfect match. There are usually distinguished two types of such color blindness: the red type and the green type. The chief difference between them is that all reddish colors to the red type look darker than the greenish colors; whereas, for the green type, the greenish colors are darker and the reddish lighter. Certain cases have also been known of yellow-blue color blindness, but these are neither so frequent nor practically so important as the red-green types. The detection of any of the red-green types of color blindness is of huge importance, for on railroads or on boats the proper readings of red and green signals are essential for the safety of the passengers. (See Holmgren and Nagel's Test.) People who are ordinarily known as color weak are often found on investigation to have certain distinct types of anomalies in their color vision, although not of such an extent as to classify them with the red-green types. It is usually stated that about four per cent of all males are red-green color blind. Cases appear very rare among females, partly, undoubtedly, because it is not necessary, for practical purposes, to investigate their color vision as often as it is that of men. Defects in color vision may be inherited. Such inheritance usually occurs through the female members of a given family, although they themselves may not be color blind. For instance, a color blind man having a son and a daughter would probably transmit his defect to his son, but not to his daughter. Her sons, however, would be likely to be color blind. R. P. A.

References: —

BALDWIN'S *Dict. of Phil. and Psych.* s.v. *Vision.*
HOWELL, W. H. *American Textbook of Physiology.* (Philadelphia, 3d ed. 1909.)
SCHAEFER, E. A. *Textbook of Physiology,* Vol. II, pp. 1088 ff. (Edinburgh, 1898–1900.)

COLOR CIRCLE. — The important relations among the members of the chromatic (*q.v.*) series of qualities are conveniently shown in a circle. The series of pure spectral colors may, indeed, be represented by a straight line with red at one end and violet at the other (see COLOR); but the whole series of purples, not being monochromatic qualities, is then unprovided for. Since the purples are obtained, however, by mixing two colors near the respective ends of the spectrum (*e.g.* red and violet), it becomes quite proper to represent the entire series of chromatic qualities by a line returning into itself, *i.e.* a circle. Let the respective ends of any diameter represent red and its complementary (*q.v.*), bluish-green, and the ends of the diameter at right angles to this the colors blue and yellow, also complementary. It is then clear that all other qualities may be so disposed on the circumference that any pair of qualities lying at the respective extremities of a given diameter are complementary. The center of the circle would thus represent white, resulting from a mixture of the end colors of a diameter in appropriate proportions. If mixed in any other proportions, the result would resemble that quality of the pair which predominated in the mixture, but would be less saturated (see SATURATION). Any diameter, therefore, would represent two complementary saturated colors at its extremities, white in the center, and, approaching the center from either color, an increasingly less saturated degree of that color.
R. P. A.



Color Circle. The center of the circle represents white. All colors placed at opposite ends of diameters of the circle are complementary colors.

References: —

JUDD, C. H. *Psychology,* p. 77. (New York, 1901.)

COLOR HEARING. — See CONÆSTHESIA.

COLOR INTENSITY. — This term is often used interchangeably with brightness (*q.v.*). Properly, however, intensity refers to the physical correlate of light sensation. Light sensation is, in brief, produced by vibrations in the ether impinging on the retina. These vibrations possess a given wave length, which is the basis of the peculiar color quality of the sensation, — its tone or hue; a given form or complexity, conditioning the saturation (*q.v.*) of the sensation; and a given extent or amplitude of vibration. It is this amplitude that conditions brightness; the intensity, and therefore the brightness, increasing, the greater the amplitude, and decreasing, the less the amplitude.
R. P. A.

References: —

BALDWIN'S *Dict. of Phil. and Psych.* s. v. *Vision.*
HOWELL, W. H. *American Textbook of Physiology* (Philadelphia, 3d ed. 1909).

COLOR-MIXING. — As understood by the physiologist or the psychologist, this term is to be sharply distinguished from pigment-mixing (*q.v.*), which is employed by artists. Physiological color-mixing depends on the independent transmission of two or more different colored lights to the same area of the retina. It can be produced, for instance, by rotating, on the same axis, two or more disks of colored paper which are, by cutting each disk along one of its radii, so superimposed, one on the other, as to form a single disk, of which each color composes a sector. If this resultant disk be then rotated rapidly enough for all flicker to disappear, the various colors will fuse into a single color different from any of them. This means that the light, from the differently colored sectors have impinged upon the same area of the retina in such rapid succession that the physiological process set up by any one of them does not disappear before the processes set up by the others occur. The result might thus be called a mixture of physiological processes. When spectral or pure colors, which are obtained by analyzing white light into its elements (the colors of the rainbow, red, orange, etc.), are mixed, by means of appropriate apparatus, the color resulting from the mixture of any two colors from red, on the one hand, to and including green, on the other, is always some intermediate color, undiminished in saturation (*q.v.*). When any two colors from the same green to violet in the spectrum are mixed, the result is, similarly, some intervening color, diminished, however, in saturation. It is thus easily seen, by utilizing three given colors of the spectrum, namely, a certain red, a certain green, and a certain violet, that one may obtain by appropriate mixtures any of the manifold spectral colors to which our eye is sensitive. When, however, any color between red and green is mixed successively with colors on the other side of green, the saturation of the resulting color diminishes very rapidly until a point is reached where all color disappears and the mixture becomes gray or white. Such pairs of colors are called "complementary colors," (*q.v.*). Beyond this point the mixture becomes purple, and it is among the purples that the complementary to pure green is found. See Color Circle. R. P. A.

References: —

Baldwin's *Dict. of Phil. and Psych.* s. v. *Vision.*
Ebbinghaus. *Grundzüge der Psychologie.* 2d. ed., vol. 1. (Leipzig, 1905.)
Howell, W. H. *American Textbook of Physiology.* (Philadelphia, 3d. ed. 1909.)
Schaefer, E. A. *Textbook of Physiology.* (Edinburgh, 1898–1900.)

COLOR OF WALLS OF THE SCHOOL ROOM. — See Architecture, School.

COLOR SATURATION. — The degree of saturation of a color is the degree to which it approaches one of the neutral grays. The spectral colors are the most saturated, and the various tints (*q.v.*) and shades (*q.v.*) the least saturated that we know. In general, one decreases the saturation of any member of the chromatic (*q.v.*) series by mixing with it one of the achromatic (*q.v.*) series. Saturation and brightness (*q.v.*) or intensity (*q.v.*) are closely related, since a change in one is accompanied by change in the other — for example, increase in intensity brings decrease in saturation. Any color, however, of a given brightness, when mixed with a gray of the same brightness, would have its saturation decreased with no change in the brightness.

References: —

Baldwin's *Dict. of Phil. and Psych.* s. v. *Vision.*
Howell, W. H. *American Textbook of Physiology.* Philadelphia, 3d. ed. 1909.)
Schaefer, E. A. *Textbook of Physiology.* (Edinburgh, (1898–1900.)

COLOR WORK. — Studies in the theory of color, with exercises in hue, value, and chrome; copies of color schemes from Japanese prints, textiles, etc.; original color compositions for designs, decorations, or pictures.

See Art in the Schools; Art, Method of Teaching.

COLORADO COLLEGE, COLORADO SPRINGS, COL. — A coeducational, nonsectarian institution, the oldest college in the state, established in 1874 without denominational or state assistance, and under a Board of Trustees including representative professional and business men of Colorado. Before the organization of the college, a grant of land was made, in 1873, by the Colorado Springs Company, the founders of the city of Colorado Springs. Slow progress was made until 1888, when, upon the election to the presidency of William Frederick Slocum, the faculty was enlarged, the curriculum was revised and broadened, and Cutler Academy was incorporated as an associated preparatory school. Colorado College is one of the institutions originally accepted by the Carnegie Foundation for the Advancement of Teaching (*q.v.*) to participate in its system of retiring allowances to teachers. Besides the usual undergraduate courses in arts and science, admission to which is by examination or certificate from an accredited high school, the institution maintains a school of engineering opened in 1903 to meet the demand in the Rocky Mountain region for instruction in applied science. There are also schools of music and of forestry. In December, 1907, Colorado College completed an endowment fund of $500,000. Gifts from private sources during 1907–1908 amounted to $436,542; the annual income averages about $55,000. The average salary of a professor is $1666. There are (1909) 48 members on the instructing staff, of whom 13 are full professors. The students numbered (1910–11) 561, divided as follows: schools of liberal arts, science, and engineering, 520; school of music, 71. C. G.

COLORADO SCHOOL OF MINES, GOLDEN, COL. Established by act of the territorial legislature, Feb. 9, 1874. General control of the institution is vested in a Board of Trustees consisting of five members, each serving four years, appointed by the Governor of the state, with the advice and consent of the senate. The school supplies unusual facilities for the observation of practical mining work; within reach is a variety of smelting, mining, and milling work; in addition, numerous clay mines, coal mines, and quarries are located near Golden. The oil fields of Florence, the iron mines of Wyoming, and the copper regions of Arizona and Montana are also accessible. The departments of instruction include mining, metallurgy, geology, and mineralogy, civil, mechanical, and electrical engineering, physics, and chemistry. The only cultural work is a senior course in English composition given by the president. Admission to the school is by certificate or examination from accredited high schools. The college offers two four-year courses, leading to the degrees of Mining Engineer (E.M.) and of Metallurgical Engineer (E. Met.). Postgraduate courses for graduates of other colleges lead, after two years, to the same degree; there are additional postgraduate courses for advanced students specializing along particular lines of applied science. In 1906 grounds, buildings, and equipment were valued at $446,341; the total annual income was about $100,000. The average salary of a professor is $2250. The instructing staff numbers 22. There are, 1910–11, 331 students. C. G.

COLORADO STATE AGRICULTURAL COLLEGE, FORT COLLINS, COL. — Established as a land-grant college and opened in 1879. Courses are given in agriculture, civil and irrigation engineering, electrical and mechanical engineering, domestic science, horticulture, forestry, veterinary science, and general science for women. In addition courses in music, oratory, and physical culture are maintained. Students are admitted either upon certificates from accredited high schools or by examination, for which the requirements are 15 units. Degrees are conferred on the completion of four-year courses. The college conducts farmers' institutes and short courses for farmers, and coöperates with teachers and superintendents of schools in the movement to introduce agricultural and domestic science into the public schools. There are 31 professors, and 40 instructors and assistants.

COLORADO, STATE OF. — Organized by Congress as a territory in 1861, from parts of Kansas, Nebraska, New Mexico, and Utah, and admitted to the Union in 1876 as the thirty-eighth state. It belongs to the Western Division of states, and has a land area of 103,645 square miles. For administrative purposes the state is divided into 59 counties, and these are divided, in turn, into school districts, cities, and towns. In 1910 Colorado had a population of 799,024, and a density of population of 7.7 per per square mile.

Educational History. — Colorado was practically an unknown country previous to 1859. The first settlers were largely men, and a transient population as well; there were a few women and children. A private subscription school was opened in what is now the heart of Denver in October, 1859, with 13 children in attendance. The first schoolhouse was built in 1860 at Boulder, and the first public school was established there. By 1861 the population had increased to such an extent that Colorado was organized as a territory by Congress, and the first territorial legislature passed the first school law in September, 1861. This provided for the appointment of a Territorial Superintendent of Common Schools, at an annual salary of $ 500, and for a school system modeled on that then existing in Illinois. Only a very imperfect form of organization was effected during the next ten years. School funds were often misappropriated, and the few schools in existence were largely neglected. In 1865 the office of Superintendent of Common Schools was abolished, and the Territorial Treasurer was made *ex officio* Superintendent. In 1870 the school law was revised and the outlines of the present system laid down. The office of Superintendent of Public Instruction was re-created, the appointment to be made by the Governor; school boards were given more definite authority in the control and management of the schools; provision was made for organizing new districts; and the school revenues were increased. In 1870 a state agricultural college (*q.v.*) and a state school of mines (*q.v.*) were nominally established, though the agricultural college did not open and the school of mines did not receive any permanent support until 1879. In 1871 the site was procured for the state university (*q.v.*), which had nominally been established ten years earlier; in 1874 the first appropriation for buildings was secured; and in 1877 the first appropriation for maintenance was secured and the institution was opened to students. In 1875 a State Teachers' Association was formed for the first time.

The constitution of 1876, adopted at the time of the admission of Colorado into the Union, made very definite provision for a state school system. The general supervision of the public schools of the state was given to an *ex officio* State Board of Education, with a Superintendent of Public Instruction, as its president; a county superintendent who was also to be *ex officio* Commissioner of School Lands, was provided for each county; a thorough and a uniform system of free schools was ordered for the state, and a three-month school for each district; the school fund was defined and declared inviolable; aid to sectarian schools, and the teaching of sectarian tenets, were forbidden; an *ex officio* Board of Land Commissioners was created to care for the public school lands; compulsory education for all able children was to be required "for a time equivalent to three years"; a Board of Regents for the state university and boards of education for school districts were provided for; and the prescription of textbooks for the public schools by the legislature, or by the State Board of Education, was forbidden. The school law of 1877 carried these constitutional mandates into effect. In 1889 the state normal school was established at Greeley, and it opened its doors to students in the following year. In 1890 a state course of study was prepared and adopted by the State Association of County Superintendents. In 1889 the first compulsory education law was adopted; in 1899 the law was revised and perfected; and in 1901 all school districts having more than 1000 census children were permitted to establish truancy districts. In 1903 the union high school law was passed. In the same year an effort was made to stop the unnecessary subdivision of school districts.

Present School System. — The school system of Colorado, as at present organized, is as follows. At the head is a State Superintendent of Public Instruction, a State Board of Education, a State Board of Examiners, and a State Board of Land Commissioners. The Superintendent of Public Instruction is elected by the people for a term of two years, and receives a salary of $3000. He, or she (a woman has been Superintendent continuously since 1894) is also *ex officio* State Librarian, president of the State Board of Education, and a member of the State Board of Examiners and the State Board of Land Commissioners. The Superintendent is charged with the duty of visiting the counties and of stimulating an interest in education in the state; of reporting to the Governor on the condition of the schools; of preparing all blanks and report forms needed; of rendering legal decisions on all appeal cases; of preparing all examination questions used at the quarterly examinations of teachers in the counties of the state; of apportioning the state school funds to the counties; and of acting as State Librarian.

The State Board of Education is composed of the Secretary of State and the Attorney-General, in addition to the State Superintendent, who is president of the board. The functions of this board are to grant state diplomas on the recommendation of the State Board of Examiners, and to revoke them for cause; and to hear and to decide appeals from the decisions of county superintendents. The State Board of Examiners conducts examinations for state certificates, and is a body made up in a curious manner, the law providing that it shall be " such as the Superintendent of Public Instruction, the President of the State University, the President of the State Agricultural College, the President of the State School of Mines, and the President of the State Normal School may appoint; *provided*, That the State Superintendent of Public Instruction shall be a member of said Board, and the presiding officer thereof." The State Board of Land Commissioners consists of the Governor, the Secretary of State, the Attorney-General, and the Superintendent of Public Instruction. To this board is given control of all lands belonging to the state, and they are directed " to manage the same as the best interests of the state shall require."

For each county there is a county superintendent of schools, but no county board of education. The superintendent is elected by the people for a two-year term. In salary he receives from $1000 to $2800, according to the size of his county. He is charged with the duty of supervising the schools of the county; of visiting each school once each quarter that it is in session; of inspecting the accounts of the school district officers; of keeping a full and complete record of his official acts; of appointing school directors in case of vacancies; of carefully examining and comparing the school census lists of the various school districts; of apportioning quarterly the county school money to the different school districts; of conducting the quarterly examinations for teachers' certificates, using for this purpose the questions prepared by the Superintendent of Public Instruction; of holding such teachers' institutes as may be necessary or required; and of making an annual report to the Superintendent of Public Instruction.

Each county is divided into school districts. These are of three classes. Districts having over 1000 census children, 6–21 years of age, belong to the first class, and have boards of school directors of five members each, elected for five-year terms, one elected each year, and such boards elect their own officers. Districts having from 350 to 1000 inclusive belong to the second class, and districts having less than 350 census children belong to the third class. Second and third-class districts have a board of school directors of three, one elected each year for a three-year term, and the people vote directly for directors as president, secretary, and treasurer. Each board of directors has power to employ and discharge teachers and other employees; to suspend and expel pupils; to admit nonresident pupils and to fix the rates of tuition of such; to adopt textbooks, and, on the vote of the people, to provide them free to the pupils; to manage the school property, and to repair or build schoolhouses, as directed by the district; to determine the number of teachers, and the length of the school term; and is required to make an annual report to the county superintendent of schools. The secretary of the board, or some one appointed by him, must take an annual school census of all children between the ages of 6 and 21, and report the same to the county superintendent. An annual district meeting must be held to elect a director and to vote a district tax for maintenance and for lengthening the term. In case of failure to elect a director, the county superintendent appoints, and in case of failure to levy a tax for maintenance, the county commissioners must levy a tax on the property of the district. All cities are classed as school districts, and to their boards of directors are given the same powers and duties as are prescribed for districts of the third class, except that first-class districts may examine and certificate their own teachers, though such certificates are not valid for teaching elsewhere. (See special article on DENVER.) New districts, may be organized by petition and election, though, since 1903, no district can be subdivided that does not have an assessed valuation of at least $20,000, a school census of at least forty, and, after division, each of the new districts must have a school census of at least twenty. Two or more districts may unite at any time to form one, by election and a majority vote.

School Support. — The state originally received 3,715,555 acres from the 16th and 36th section grants made by Congress for schools, besides two townships for a university, and 90,000 acres for an agricultural college. As Colorado was admitted later and at a time when the states were not so hard pressed for money for education, the state has been able to profit by the unfortunate experience of many other states. The enabling act for the admission of Colorado to the Union established a minimum sale price of $2.50 per acre, and this was raised, by law, to $3.50 in 1887. But little of the land has been sold, despite a strongly advocated early policy of selling the lands as soon as possible. The policy has been to lease the land instead. Up to 1908 but 187,402 acres had been sold, while 3,374,169 acres remained, about one third of which was under lease. The total permanent school fund of Colorado consists of $1,601,907 in invested cash. In addition, the state owes the common school fund $1,225,975, for school money invested over twenty years ago, in interest-bearing state warrants, which the state has since repudiated and so far refused to pay, though the constitution makes it mandatory on the state to replace losses to the fund. The remaining lands are estimated to be worth, on an average, $10 an acre. The interest on the invested cash, together with the rent of school lands, gives an income of about a quarter of a million dollars, and this is distributed to the counties on the basis of the number of children between the ages of 6 and 21.

Each county is required to levy a county school tax of not less than two nor more than five mills, but sufficient to maintain at least four months of school in each district, counting teachers' salaries at $40 a month. The state school money is added to the county tax and to the income from fines payable to the school fund, and the entire sum is apportioned to the different school districts in the county on the basis of the number of children of school census age. Each district must levy a special district tax for the yearly maintenance of the school property and the miscellaneous expenses of the district, and may levy additional funds to provide better school facilities or a longer term. Directors in third-class districts are limited to 15 mills, but, by a vote of the electors of the district, this amount may be exceeded. Buildings must be provided by the district.

The total amount expended for schools during the last year for which reports are available was $4,550,686. Based on the total population of the state, this was equal to a per capita expenditure of $7.10 a year, as against $4.27 for the U.S. as a whole, and $7.49 for the Western Division. The average daily expenditure per pupil was 26.3 cents and the total yearly expenditure per pupil in average daily attendance was $43.64, as against 19.8 cents a day and $30.55 a year for the U.S. as a whole. Only eight states spend more for either item. In amount raised per child, 5–18 years of age ($29.30), the state stands fifth. The total amount of money raised per adult male was $21.08, the state standing seventh in this item, and the amount being nearly twice the average for the U.S. ($15.79). The wealth of the state is evident in that each adult male must contribute only 72 cents to provide $1 for each child, 5–18 years of age, in the state, as against 82 cents for the North Atlantic Division and $1.02 for the U.S. as a whole. These figures, combined with those for attendance and term, show both the large relative wealth and the very large expenditures which the state makes for education.

Educational Conditions. — Of the population of 1900, 83.1 per cent were native born; 98 per cent were white; by sex, 54.7 per cent were males; and 22.5 per cent were children between the ages of 5 and 18 years. The state is mountainous, and is essentially a mining state. Large areas are practically uninhabited. Of the total population, 30 per cent live in cities of over 25,000 inhabitants, and 51.7 per cent live in rural districts. Of the school population, 5–18 years of age, in 1907–1908, 101.25 per cent were reported as enrolled in the public schools, as against 88.19 per cent in 1899–1900, 72.20 per cent in 1889–1890, 60.82 per cent, in 1879–1880, and 42.28 per cent, in 1870–1871. The average for the U.S. as a whole was 69.32 per cent. Of the number enrolled, 65.06 per cent were in average daily attendance, which equaled an average daily attendance of 109.5 days per year for each child in the state, 5–18 years of age, and 109.5 for each child enrolled. The average length of term provided in Colorado was 166.2 days, as against 154.1 days for the United States as a whole, and 163.3 days for the Western Division.

Colorado has a reasonably good compulsory education law, which from the statistics of attendance would seem to be well enforced. All children under 14, and under 16 if they cannot read and write, must go to school at least half of each day, if not employed, unless excused from attendance for cause. All boards of school directors, in districts having 350 census children or over, are required to appoint truant officers to enforce the law; all cities having a total population of 100,000 or over (Denver) must provide a truant school; and cities of 25,000 or over may do so. If a child of school age must work to support itself or to support a dependent person, or if the parents are too poor to provide the necessary shoes, clothing, or books, it is then the duty of the poor relief authorities to extend such relief as will enable the child to attend school. No child under 14 can be employed to labor in any business whatever during school hours, unless the child has attended school at least 12 weeks in each year, 8 weeks of which must have been consecutive, and he must possess a certificate to that effect signed by the teacher. School directors are charged with the duty of enforcing the law. Colorado stands well toward the top of the column in literacy, the state having but 4.2 per cent of illiterates in the total population 10 years of age or over, while the lowest percentage found in any state was 2.3 per cent. Almost all of the Colorado illiteracy is found among the foreign born, most of whom are miners.

In material conditions the schools have made remarkable progress within recent years, and most of them are now relatively well equipped. Despite the fact that 40 per cent of the teachers of the state are teaching in rural school districts, and that about 15 per cent of the school buildings still in use are built of sod, adobe, or logs, the average value of all of the school buildings of the state was $5216 at the last report, and the expense for new buildings is increasing rapidly. Of all school money raised, 19.4 per cent. was expended for sites and buildings in 1907–1908 and 11.6 per cent in 1908–1909.

The board of directors of any school district are permitted to levy a special school library tax, not to exceed one tenth of a mill, the proceeds of which are to be used in building up a school district library. Any board of school directors may establish a kindergarten, and pay the expenses of the same by a special tax. Six cities provide work in manual training, in three cases extending the work through the high school. Some work in manual training is also offered in a few of the smaller towns.

Teachers and Training. — The state employed 5291 teachers in 1907–1908, of which 85.3 per cent were women. Of the total number, about 64 per cent were employed as teachers in graded (town and city) schools, at an average monthly salary of $92.95 for men and $65.35 for women, and for an average yearly term of 176.2 days. The average monthly salary for teachers in rural schools was $56.80 for men and $51.57 for women, and for an average yearly term of 136.3 days. Three grades of certificates are issued on examinations, held quarterly by the county superintendents, on questions prepared by the Superintendent of Public Instruction. The examination embraces all of the common school studies, theory and practice of teaching, and the school law of Colorado. Teachers of previous teaching experience who pass with a high average are granted a first-grade certificate, valid for three years, renewable, and with intercounty recognition. Others who pass with high grade receive a second-grade certificate, valid only in the county where issued, and for 18 months. A third-grade certificate, valid for 9 months, is also issued. Those who expect to teach in high schools must also pass an examination in the high school subjects which they propose to teach, and this virtually constitutes a fourth grade of teachers' certificate. Graduates of the normal school of Colorado alone are exempt from the examinations.

State certificates valid anywhere in the state are granted by the State Board of Education, on the recommendation of the State Board of Examiners, to: (1) Those who have established their eminent professional ability by teaching at least two years in the state, who hold a first-grade certificate, and who pass an additional state examination; (2) without examination, to those who have taught six years and have rendered eminent professional services to the schools of the state. Life diplomas and state certificates from other states are not recognized. No statistics are available to show what percentage of the teachers of the state held these different grades of certificates. To train teachers for the schools, the state maintains the Colorado State Normal School at Greeley, which is a large and a well-equipped institution. What percentage of the teachers of Colorado have had normal training cannot be told, but something is indicated by the fact that during the first fifteen years of its existence the state normal school graduated only 965 students, though in 1908 it graduated 180. One private normal school, with 77 students, is listed for the state. As a means of training teachers in service, the state makes provision for the maintenance of a normal institute for at least two weeks in each of the 13 institute districts into which the state is divided. The state controls these normal institutes, but makes the teachers and the counties pay for them. The State Superintendent, the president of the state normal school, and a committee of county superintendents of each district determine the time and the place of the institute, and select the conductor for the institute. All conductors, members of the state normal school faculty excepted, must hold certificates of qualification issued by the State Board of Examiners. A state institute course of study has been adopted, in syllabus form, to be followed by the conductors.

Secondary Education. — By 1908, the last year for which complete statistics are available, there were 77 district (town and city) high schools in Colorado, 13 county high schools, and 9 union district high schools. Eleven of the district high schools were in cities of 8000 or more inhabitants, and one, the Manual Training High School of Denver, is a large technical high school. These 99 public high schools report a teaching force of 427, and 10,321 students enrolled. Private high schools are a very minor factor in Colorado, only 5 being reported, with 22 instructors (all women) and 184 students. Any district having more than 350 census children may form a high school whenever the board of school directors may deem it expedient. Any two or more contiguous districts may unite to form a union high school. In counties not smaller than the fifth class (there are seven classes), a county high school may be formed by a majority vote of the taxpayers of the county, called by a petition of 50 electors to the superintendent of the county. A county tax of a sum not to exceed 2 mills may be levied for the support of a county high school. In union high schools the union district shares in the state apportionment of school fund, just as an elementary school district, and the balance needed is provided by the uniting districts in proportion to the number of pupils attending the high school from each district. No provision exists by which a high school, once formed, can be discontinued. The high school legislation of Colorado, while better than that of many other states, still leaves something to be desired in the matter of support. Separate funds are not provided, the method of supporting district high schools is unsatisfactory, and the whole method opens the way, as is the case in many other states, for the development of fine high schools at the expense of the elementary schools beneath.

Higher and Technical Education. — The state maintains the University of Colorado (*q.v.*) opened in 1877 at Boulder, for the collegiate instruction of men and women; the state agricultural school (*q.v.*) at Fort Collins, opened in 1879 for instruction in agriculture, science, and mechanic arts; and the state school of mines (*q.v.*) at Golden, opened in 1874, for instruction in metallurgy, mining, and engineering. The higher instruction provided by the state is supplemented by the following private institutions: —

NAME	WHERE	CONTROL	OPENED IN	FOR
University of Denver (*q.v.*)	Near Denver	Meth.	1864	Both sexes
Colorado College (*q.v.*)	Colorado Springs	Non-sect.	1874	Both sexes
College of the Sacred Heart (*q.v.*)	Denver	R. C.	1888	Men

The University of Denver also offers professional instruction in law and dentistry.

The state also maintains the State Industrial School for Boys, at Golden; the State Industrial School for Girls, at Morrison; and the Colorado School for the Deaf and Blind, at Colorado Springs. The first two are reformatory institutions. E. P. C.

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COLORADO, UNIVERSITY OF, BOULDER, COL. — A state university under the control of a Board of Regents elected by popular vote. The university was incorporated by an act of the territorial legislature in 1861. After receiving sums of money and land from the legislature, Congress, and private sources, provision was made in the state constitution to adopt the university as a state institution in 1876. The university thus became entitled to the land grants from Congress. The new state institution was then opened in 1877 with preparatory and college departments; a medical school followed in 1883; in 1892 a law school was opened and graduate courses were offered; the college of engineering was established in 1893; in 1904 the summer school was instituted; in 1906 the college of commerce and in 1908 the college of education were organized. The preparatory department was closed in 1907. The plant now includes 17 buildings used for purposes of instruction and as dormitories. Well-equipped laboratories and several valuable collections are maintained. Students are admitted to the college of arts, commerce, and education on fulfilling requirements equivalent to 15 units of high school work. Admission is by examination or certificate of an accredited high school. For entrance to the school of law two years of work in the college of liberal arts will be required after 1911. The requirements for the school of engineering include more units of mathematics and less of languages than the college of arts. The admission requirements for the medical school are those laid down by the Association of American Medical Colleges with the addition of two years of work in the college of liberal arts. In the session 1909–1910 there were enrolled 1221 students, distributed as follows: graduate school, 83; college of liberal arts, 577; college of engineering, 292; school of medicine, 80; school of law, 102; summer school, 113. The faculty includes 87 professors and 7 assistant professors, 73 lecturers, instructors and assistants. James H. Baker, M.A., LL.D., is the president.

COLUMBA, ST., ABBOT OF IONA. — Born in Donegal County, Ireland, 521, and educated in the monastic school of Moville and afterwards in the monastery of Clonard. Columba was active in the foundation of the monasteries of Derry, Durrow, and Kells; but in 563 he turned his missionary energies toward Scotland, and became the apostle of its conversion. He was presented with the isle of Iona, where soon arose by the labor of his hands and those of his twelve comrades the beginnings of the greatest of the early Scottish monasteries. From Iona Columba made journeys throughout Scotland, erecting monasteries wherever he met with a favorable reception. Near these monasteries churches were built, and the Abbot of Iona, though no more than a simple presbyter, consecrated bishops with the advice of a *collegium seniorum* of his convent. With the monasteries came to Scotland the monastic schools and learning which at that time were nowhere better represented than among the Irish Celts. St. Columba died at Iona in 597. P. R. C.

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COLUMBAN, or ST. COLUMBANUS. — An Irish monk, one of the most sincere and powerful preachers and writers of his day, was born in Leinster about 543; died in a cavern near his monastery at Bobbio, near Pavia, in 615. Columban received his education first on one of the islands of Lough Erne and afterwards at the monastery of Bangor. It is clear that he represented the highest culture of his age, since he possessed a knowledge of Juvenal and other ancient poets and of the early Fathers. About the year 585 Columban went to Gaul, and, finding his way to Burgundy, succeeded in founding monasteries at Anegray, Luxeiul, and Fontaines. He drew up a monastic rule, which may be found in Migne, *Patrol. Latina*, Vol. LXXX. This rule, like the Benedictine, enjoins the copying of manuscripts as a monastic duty, and even prescribes the task of teaching in schools. Drawn into a controversy with the French monks, Columban was banished from Burgundy on charges of attacks upon the King and the Queen Mother, and of keeping Easter at the unorthodox season that was favored by ancient Irish custom. Columban thereupon departed to Nantes, thence to the Rhine and Zürich, thence to Zug and Lake Constance. After two years of preaching to the heathen in this vicinity, Columban turned his face toward Italy, and was well received in Lombardy, where he founded his monastery of Poggio about 613, some two years before his death.

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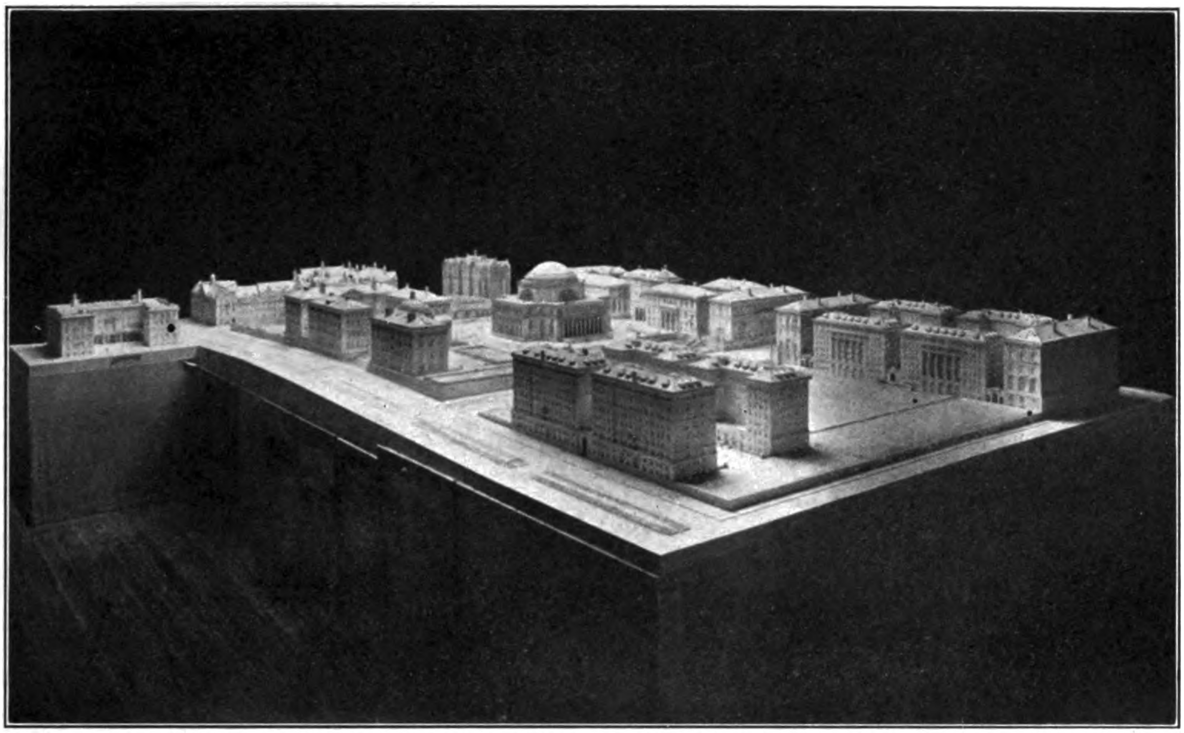
COLUMBIA COLLEGE, COLUMBIA, S.C. — Chartered in 1854 for the higher education of women, and opened in 1859. It is under the auspices of the Methodist Episcopal Church, South. Preparatory, collegiate, musical, and commercial departments are maintained. The college courses which lead to bachelor's degrees in arts and science are based on about 14 points of high school work. There is a faculty of 21 instructors.

COLUMBIA JUNIOR COLLEGE, MILTON, ORE. — A coeducational institution founded in 1899 and maintaining preparatory, academic, collegiate, commercial, and fine arts departments. The college course is based on about 8 points of high school work.

COLUMBIA UNIVERSITY, CITY OF NEW YORK. — An institution which in point of student enrollment is the largest educational institution in the United States, had its beginnings when, in 1754, a fund of £3500 having been raised by public lottery, George II of England granted a royal charter for King's College, and in the following year a building was erected upon land given by Trinity Church. The first president and the sole instructor of the eight students who enrolled was the Rev. Dr. Samuel Johnson, a man distinguished among the colonists of the eighteenth century for scholarship and philosophical insight. After his resignation in 1763 came Myles Cooper, who was an ardent royalist and who promptly returned to England at the outbreak of the Revolution. The college exercises were suspended, leaving Alexander Hamilton and other patriotic students free to take up arms. In 1784 the institution was reopened, and in 1787 was rechristened Columbia College. The new president was William Samuel Johnson, one of the framers of the Constitution and United States Senator from Connecticut. Johnson, who was the son of the original head of King's College, was probably the first lay college president among English-speaking peoples.

Until the middle of the nineteenth century the college grew very slowly. Many of the professors were men of distinction, including Samuel Mitchill, also United States Senator, Robert Adrain, the mathematician, and Charles Anthon, the classicist. The alumni of this period, also, continued to play an important part in the development of the city and the state, including as they did such men as DeWitt Clinton, Hamilton Fish, and Abram S. Hewitt. The financial resources of the institution, however, were inadequate, and the student attendance never rose much above a hundred. In 1849, however, Charles King was appointed president, and the development began which changed a denominational college, making only a local appeal and having but 125 students and 7 or 8 professors to a national institution having to-day more than 7000 students and more than 600 instructors. During King's presidency the college moved from its original home in Church Street to East 49th Street. A law school was established in 1858, and a school of mines and metallurgy in 1864. In 1860 came a nominal union with the College of Physicians and Surgeons, which in 1817 had absorbed the original medical department, founded under Cooper in 1765. His administration was distinguished also for the presentation, in 1857, of a trustees' report outlining the establishment of courses of research and other university developments.



Architectural Model of Columbia University.

The Low Library.

COLUMBIA UNIVERSITY.

which, though conceived in advance of its time, marks an important step in the history of higher education in the United States.

President Frederick A. P. Barnard's administration, 1864 to 1889, was one of continuous growth. The income from the two main endowments of the college, the Trinity Church land and the Botanical Garden on Fifth Avenue (given by the state legislature in 1814) had increased with the growth of the city, and the institution was now upon a financial basis which made development possible. A school of political science was established in 1880, a department of architecture in 1881, and during this decade additional technological courses were established. Barnard was a leader in the movement to provide for the higher education of women. To his influence is due the independent establishment in 1889 of Barnard College (*q.v.*). He was also one of the first to appreciate the dignity of teaching as a profession and the necessity for adequate preparation therefor. He gladly lent his aid to the modest beginnings of Teachers College (*q.v.*), which was founded in 1888, and was destined to become one of the most vital parts of the university that was to grow out of Columbia College.

President Barnard died in 1889, his successor being Seth Low, of the class of 1870, former Mayor of Brooklyn and after his resignation as president, Mayor of the city of New York. During Mr. Low's administration, 1890–1901, the several schools, which had up to that time been but loosely connected, were welded into an organic whole. In 1890 the school of philosophy was established for graduate work in philosophy and letters. In 1891 the College of Physicians and Surgeons, which had previously had an independent charter, was merged in the university. In 1892 the graduate school of pure science was organized. In 1896 the title Columbia University was adopted, and in the following year the institution moved to its present site on Morningside Heights. In 1900 a summer session and a department of extension teaching were established.

During the administration of President Nicholas Murray Butler, '82, who at the time of his election in 1901 was dean and professor of philosophy and education, the university has grown rapidly in numbers and influence. Additional land has been purchased, many new buildings have been erected, and the financial resources largely increased. In 1904 the New York College of Pharmacy, while retaining its corporate existence, became the school of pharmacy of the university. In 1906 a faculty of fine arts was formed. Other incidents of this administration have been the reëstablishment of dormitory life for the men — the institution having had no dormitory since the eighteenth century. A close alliance has been formed with the New York School of Philanthropy, with the Prussian Ministry of Education for an annual exchange of professors, with Yale University for a joint course in preparation for public service. The ties with the nearby theological seminaries established during Mr. Low's administration have been made closer, particularly in the case of the Union Theological Seminary, the new buildings of which are contiguous to the university. Provision has been made by Mr. Joseph Pulitzer for the establishment, in the future, of a university school of journalism, and plans are being matured for the organization of courses in forest engineering, agriculture, landscape gardening, and preventive medicine. Teachers College has grown remarkably, and is doing pioneer work of the greatest importance in household and industrial arts. (See HOUSEHOLD ARTS.)

Columbia University is still operated under the original charter of King's College, last amended in 1811. A self-perpetuating board of 24 trustees, one fourth of whom, however, are now nominated by the alumni under the Dartmouth plan, hold the title to all property, appoint all officers, and have ultimate control over the affairs of the university. The work of the trustees — and it is a real working board — is mainly done in small standing committees, on education, finance, buildings and grounds, etc. Except for the care of the finances, which is in the hands of the treasurer, the president has charge of the general administration. Columbia is rather conspicuous for the number of officers assisting the president, whose work is wholly or mainly administrative, and for the responsibility entrusted to them. The theory of the trustees is that routine administrative work done by teachers is done at the expense of their scholarly work, and provision being made in the faculties and council for the formulation of educational policies, the carrying out of these policies is falling more and more into the hands of these administrative officers, who include the twelve deans and directors, who are in immediate charge of their several schools, the librarian, the chaplain, consulting engineer, secretary, registrar, alumni secretary, bursar, and superintendent of buildings and grounds.

There is the customary subdivision of officers of instruction into faculties on the basis of programs of study, and into departments and divisions on the basis of subjects or groups. The highest academic body is the University Council, consisting of the president, the deans (who are appointed by the trustees), and two elected members from each faculty. The council was organized under President Low, largely for the purpose of standardizing graduate work, but with time it has taken on larger functions, and important matters of university policy are now customarily referred to it before action is taken by the trustees.

The educational policy of the university may be broadly summarized as follows. Entrance to the collegiate courses, Columbia College for men and Barnard College for women, is so administered as to permit the entrance of any worthy student who can show, by examination, the preparation of a good secondary school course or its equivalent. Once admitted, the quality of the work of a college student, quite as much as its quantity, is considered in advancing him for graduation, and under the operations of the present rules, many students graduate in three or three and a half years. As has not been infrequent in rapidly growing institutions, the question of efficiency in teaching had not until recently been receiving its due prominence in the administration of these colleges, but at present this question is undergoing careful scrutiny on the part of the university.

Entrance to the professional schools — law, medicine, mines, engineering and chemistry, architecture, education, pharmacy — should be based upon more than a secondary school training, but should not be unduly delayed by demanding a four-year college course as a prerequisite. Columbia was the pioneer in making provision for combining collegiate and professional courses, and has developed this plan until at present the capable student can complete the requirements, both for the bachelor's degree and any professional degree, in six years. Excepting the college of pharmacy, the schools of applied science are the only ones which do not now require for entrance at least two years of college work, and here the preliminary college work is strongly recommended and is being taken by an increasing number of students. The courses of higher instruction and research are open only to those who have had college training, including special preparation for advanced work in the major subjects. These students are given the greatest possible freedom in the choice of subjects and in the prosecution of their work. The summer session and the extension courses, beside giving an opportunity to those who cannot take university work at other times, are valuable elements of articulation between the university and other institutions, and through them students are frequently enabled to complete their university requirements without an undue loss of time.

In all its work, it is the policy of the university to take every possible advantage of its metropolitan situation and to enlist the coöperation not only of the libraries, museums, hospitals, and other public institutions, but of the personal service of the experts in every branch of knowledge, its own alumni and others, who naturally congregate in a great city. The student of architecture, for example, has the benefit of criticism by leaders of the profession of his own choosing, and the engineering student similarly meets men whose advice is of the greatest value to him. Provision is made whereby senior medical students have continuous service as clinical clerks in the hospitals of the city.

The university library numbers about 430,000 volumes, and the scientific equipment for instruction and research is in general very good, the laboratory equipment being constantly replenished from the income of a large fund bequeathed for the purpose by the late Stephen Whitney Phœnix, '59.

The physical appearance of the university is impressive. It stands on the summit of a rocky hill in the northern part of Manhattan Island, surrounded by a notable group of public buildings, including the Cathedral of St. John the Divine, St. Luke's Hospital, the Union Theological Seminary, the Institute of Musical Art, and Grant's tomb. (The schools of medicine and pharmacy are at present at 59th Street and 68th Street respectively.) The grounds at Morningside, including those of Barnard College and Teachers College, cover 32 acres. There are in all 41 university buildings having a total floor area of 1,677,691 square feet, erected at a cost of about $11,500,000. The buildings of the University Corporation are being erected in accordance with a unified architectural scheme of great dignity, for which credit is mainly due to the late Charles F. McKim. The central library, the gift of President Low as a memorial to his father, is a classical building of white limestone, and the surrounding buildings are of brick with limestone trimmings. The university has land enough for a normal growth during the next ten or fifteen years, but the city is rapidly closing about it, and as the present value of vacant land in the vicinity is more than $1,000,000 per city block, the difficulties surrounding its future growth cannot be overestimated. The preliminary legal steps have been taken for an interesting project to provide a university stadium by filling in the Hudson River shore at a point a few hundred feet distant from the university.

The teaching staff, which now numbers more than six hundred, has its share of the most distinguished American instructors and investigators. It is being constantly recruited by men for whom the stimulus of metropolitan life is a more powerful factor than its undoubted expense. Perhaps the university is most notably strong at present in the political and social sciences, and in the fields of education, English, philosophy, and technology. As is likely to be in the case of an urban university, the intellectual pace is swift, and the 1150 titles in the annual university bibliography contain more than the average number of contributions of permanent value to scholarship.

The students registered in 1910–1911 are divided as follows: Columbia College, 729; Barnard College, 521; nonprofessional graduate schools, 991; law, 365; medicine, 316;

mines, engineering, and chemistry, 713; fine arts, 179; pharmacy, 283; Teachers College, 1402, and summer session, 2632, a total, excluding duplicates, of 7452. In addition there are many registered extension students. More than half the students in the university are graduates of higher institutions of learning, representing in each year more than 250 American institutions of collegiate standing and 75 or more similar foreign institutions. Of the total registration, about one third are women.

The makeup of the student body is extraordinarily complex. In the college there have always been a number of the Knickerbocker and other old established New York families. Side by side with these are an increasing number of country boys who go to the city for their education for the same reason that many city boys go to the country. The professional and graduate students come from all parts of the world. Situated, as Columbia is, at the main gateway of the country, it is not surprising that a large number of the students are of foreign birth or parentage. The Germans of the second and third generation are here in large numbers, and the number of Italian and Scandinavian students of the same class is rapidly growing. In addition there are each year some 150 students coming direct from foreign countries. Twenty years ago Columbia was known as the " Rich Man's College." It is now coming to be appreciated as the " Poor Man's University." The opportunities in New York for students who have to support themselves are wide, and the earnings of the 500 men who report to the employment committee aggregate each year more than $150,000. In spite of the doleful predictions which were made when, in 1905, intercollegiate football was summarily abolished as an " academic nuisance," the various student activities are in a prosperous condition. Twenty-four Greek letter fraternities have chapters at Columbia. Among the innumerable other organizations, perhaps the most interesting are the clubs, semi-scholarly and semi-social, composed of instructors and students who are bound together by common interest to some subject of study. Student journalism, debating, and dramatics flourish, and the university has a creditable position in various branches of sport, notably rowing, basketball, and association football.

The annual budget of the university, including the four constituent corporations, is now over $2,500,000. Of this sum, half comes from student fees, about one fourth from the rents of real estate, one eighth from the income of trust funds, and the remainder from special gifts. Of the income about $1,500,000 is devoted to teachers' salaries and the remainder to the purchasing of books and apparatus, to the general administration, and to a sinking fund for the liquidation of the debt of $3,000,000 incurred in developing the site at Morningside.

Within the past eight years, the university has received in gifts the sum of $12,500,000, and the noble bequests of John S. Kennedy, one of the trustees, which will amount to nearly $2,200,000, and George F. Crocker's bequest of over $1,600,000 for medical research, are about to become available. The net value of the university property, taking the figures of the city tax department, for the buildings and grounds, is $36,317,000, divided as follows: Columbia College, $30,159,000; Barnard College, $3,090,000; College of Pharmacy, $133,000; Teachers College, $2,935,000.

F. P. K.

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COLUMBUS, CITY OF. — The capital and the fourth city in size in the state of Ohio, and the seat of the state university of Ohio. In 1910 the total population was 181,511. Its school census, 6–21 years of age, was 39,674 in 1909; and its total day school enrollment was 22,077, and its total night school enrollment was 290. The enrollment in private and parochial schools was 4496 additional. Of the total population in 1900, 10 per cent were foreign born and 6 per cent of the colored race. The foreign born were chiefly Germans and Irish.

The first school was opened in Columbus in 1805, and the first schoolhouse was built in 1806. By 1826 Columbus contained four English schools and a classical academy. A high school was opened in 1832. The city was incorporated in 1834; and in 1845 a special law was passed by the legislature organizing a board of education of six for the city, and granting to them certain powers. In 1847, a Superintendent of Schools was elected, the first in Ohio; the schools were graded into primary, secondary, and high schools; and the school library was begun.

The schools now operate under the general laws of the state of Ohio governing cities. The Board of Education consists of three members elected at large, and twelve from subdistricts. Election is for four years, one half going out of office every two years. The board elects a Superintendent of Schools, who nominates all teachers for election by the board. A City Board of Examiners of three, of which the City Superintendent is clerk, examines and certificates all teachers for the schools. A city normal school, with a course of a year and a half beyond the high school, trains teachers for the elementary schools. A truant officer looks after the enforcement of the compulsory attendance laws. Supervisors of music, art, and physical training are employed. Manual training is not taught in either the grades or the high school, though some instruction in domestic science is offered. German is an optional study from the third grade through the high school. Four high schools, with somewhat similar courses, are maintained. The public school library, under the control of the Board of Education, contains about 70,000 volumes.

The school system consists of a normal school, 4 high schools, and 37 day elementary schools. 591 teachers (4 in evening schools) and 5 supervisory officers were employed in 1908–1909, 91 of these teachers being employed in the high schools. The total cost for current expenses and maintenance in 1908–1909 was $713,518, 86 per cent of which was raised by local taxation.
E. P. C.

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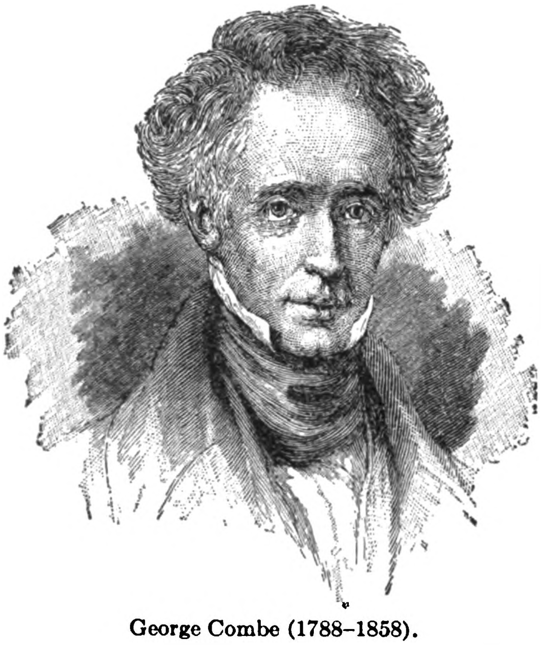
COMBE, GEORGE (1788-1858). — Phrenologist, born at Edinburgh. He was admitted to the practice of law in 1810. His career was, however, changed after 1815, when he became interested in the work of Spurzheim (*q.v.*), to whose movement he was converted. He became the leader of the phrenological study in Great Britain, and devoted the rest of his life to it, writing and lecturing on the subject and its applications. In 1819 he published *Essays on Phrenology;* in 1824 the *Elements of Phrenology*; and in 1828 appeared his most important work, *Essay on the Constitution of Man*, which ran through several editions and had great popularity. The movement had been attacked by Sir W. Hamilton (*q.v.*), and defended by Combe. The years 1838–1840 he spent in America on a lecturing tour. While there he interested Horace Mann (*q.v.*) in his work. On his return he wrote *Notes on United States.* In addition to his main study he turned his attention to education and became a strong advocate of secular schools on a national basis. In 1833 he published *Lectures on Popular Education.* Although the study for which Combe stood was early discredited by scientists, it was due to him that a strong popular interest was taken in it for many years after his death.



George Combe (1788–1858).

See PHRENOLOGY.

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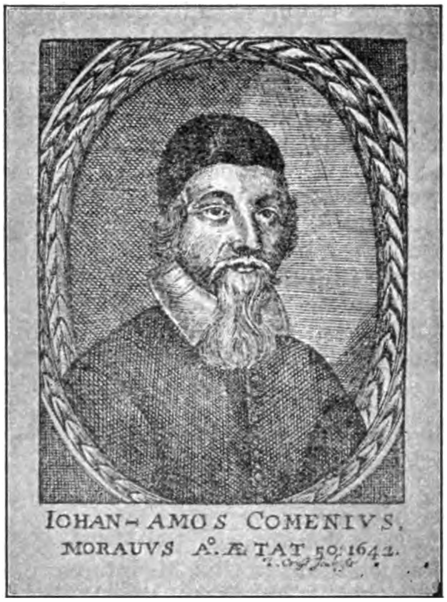
COMBINATION TONE. — A resultant tone which arises from the sounding of two loud tones together. Synonyms, "resultant tone," "third tone." Combination tones embrace difference tones and summation tones. The pitch of the first difference tone corresponds to the difference in the vibration frequency of the two generating tones. The pitch of the summation tone corresponds to the sum of the vibration frequencies of the two generating tones. Thus, in sounding the two tones A′, 435, vibrations, and C″, 522 vibrations, together, the first difference tone will be 87 vibrations (522 − 435), and the summation tone will be 957 vibrations (435 + 522). Under favorable circumstances, second, third, and even fourth difference tones corresponding to successive differences between the lowest tones present, may be heard. Combination tones play an important rôle in the enrichment of musical clangs. They are most effective when the generating tones are consonant and within the same octave. Like overtones, they ordinarily pass unrecognized in music. Two or more tones of the same pitch become one when sounded together. Thus, three organ tones of the same pitch sounded in different parts of the room will be heard distinctly as one tone which assumes a location in a specific place outside of the sounding instruments. This is called fusion sound or phantom sound, and is, in a way, related to combination tones. C. E. S.

COMBINED METHOD. — A general term applied to a mixed system of teaching which incorporates the main feature of two or more distinguishable methods. The system of teaching arithmetic partly by "topics" and partly by the "concentric circle" plan is a typical case of a "combined" or "combination" method.

See ECLECTIC METHOD.

COMENIUS, JOHN AMOS (KOMENSKY) (1592-1670). — The pioneer of modern educational science. Although his fame depends almost entirely on his work for education, Comenius would have been the last to admit that he lived for the school alone. Inspired by what he considered to be a higher mission, he was compelled throughout the greater part of his life in spite of his chief interests to devote himself to the work on which his reputation rests. Comenius was born in 1592 at Nivnitz in Moravia, and was brought up by guardians (his parents having died early) in the faith of the Moravian or Bohemian Church. From these he acquired the religious zeal and piety and earnest devotion to a cause which marked his career. He received an elementary education in the local schools, and showed no intellectual aptitude or scholarship until his sixteenth year. He was then sent to the gymnasium at Prerau. It was thus not until 1608 that he began the study of Latin, a circumstance which was fortunate, for he was old enough to appreciate the inefficiency of the prevailing methods. He saw that what was charged to the idleness of the pupils was really due to the inability of the teachers to present a lesson properly. The schools he later characterized as "slaughter-houses of the mind, . . . where ten or more years are spent in learning what might be acquired in one . . . places where minds are fed on words." In 1612 he matriculated at the University of Herborn in Nassau, where he came into contact with the encyclopedist, Alsted (*q.v.*), who was himself interested in education. About the same period the fame of Ratke (*q.v.*), who had been endorsed by the two universities of Jena and Giessen, was at its height and naturally attracted the attention of Comenius. The two years, 1612-1614, he spent at Amsterdam and Heidelberg. Returning to his native country at the age of 22, and finding himself too young to be ordained for the ministry, he accepted the position of Rector at the gymnasium at Prerau, near Olmütz. And now began the activity and reforms which were to occupy him to the end of his life. For this school he wrote an elementary Latin grammar (*Grammaticae facilioris praecepta*, 1616). At the age of 24 he was ordained, and in 1618 he was appointed pastor over Fulneck, with the additional duties of school superintendent. He was married about this time, and spent two happy years at his work. But the Thirty Years' War had broken out, and in 1621 the Spanish soldiers swept over the region where he lived and destroyed everything. He was forced to flee, and lived for a time on the estate of Karl von Zerotin, reading works on education and familiarizing himself at any rate with the more important writers. In 1622 he lost his wife and children. Five years later the Moravian pastors were proscribed, and found protection with Baron Sadowsky von Slaupna. Here Comenius wrote *Rules of Method* for John Stadius, tutor in the baron's family. He also began in Bohemia a didactic work under the influence of the *Didactic* of Elias Bodinus. In 1628 the greater part of the Moravian community was compelled to take refuge in Poland at Lissa. Among them were Comenius and his wife (he had married for the second time in 1624). Here Comenius became Rector of the Gymnasium of the Moravian Brethren. His work was now inspired by a twofold aim — to reform the schools and to educate the children of his faith for the restoration to their homes according to the current prophecies which were believed by Comenius. But he had no intention of revolutionizing method. He was willing to learn, and read much and entered into correspondence with many prominent educators. Among these was Ratke, who twice refused to vouchsafe a reply. Comenius found what he was seeking among his contemporaries; for example, he found that C. Vogel, principal of the Pædagogium at Göttingen, had introduced a graduated scheme of Latin lessons consisting of words arranged alphabetically, with the German meanings attached, to be combined into sentences. J. C. Frey, in a work on education published in 1629, had advocated the colloquial method of language-teaching and the importance of real studies. Comenius was aiming at a method of teaching which should be universal and time-saving; children were to learn with ease, and the time which was thus saved was to be devoted to studies which were of equal importance — morality and religion. For already Comenius conceived that the end of education was broader than the acquisition of knowledge, and must look to the divine. A better education would heal the dissensions of Church and State. In 1632 he completed the *Magna Didactica*, or *Great*



Didactic in Czech; this work was not published until 1849 at Prague, after it had been recovered from the archives at Lissa. At the same time Comenius had also devoted himself to the preparation of class books, which were to contribute to the larger aim expressed in the *Great Didactic.* He felt the need of a textbook including a vocabulary of essential Latin words and giving the structure of sentences as an introduction to the reading of the classical authors. A book of this type had been suggested in 1627 by Bodinus, and Comenius devoted the next few years to compiling it. It was while he was already engaged on the book that a similar work of Batæus, an Irish Jesuit settled at Salamanca, was brought to his notice. The *Janua Linguarum* of Batæus had first appeared in Latin-Spanish in 1615, was speedily produced in other languages, and in 1629 an edition in eight languages was issued. Comenius saw many defects in this: the selection of words was poor; the words, though used only once, were not given in their prime significance; the sentences did not have a moral content. In 1631 he published his own work, already completed in 1628, under the title of *Janua Linguarum Reserata, sive Seminarium Linguarum et Scientiarum Omnium* (*The Gate of Tongues Unlocked, or a Seminary of the Tongues and all Sciences*). This was his most famous book, and alone would have made him a notable character in his own century. Within a short time it was translated into Latin, Greek, Bohemian, Polish, German, Swedish, Belgian, English, French, Spanish, Italian, and Hungarian of the European languages, and into Arabic, Turkish, Russian, and Mongolian of the Asiatic. For many generations the schoolboys of three continents thumbed this book as their primer to the languages instead of the Donatus and Alexander of preceding generations. And very different from these it was, though in some respects not much less difficult. The plan of the book was simple and " natural." Starting with several thousand of the most common Latin words referring to familiar objects, the plan was to arrange them into sentences, beginning with the simplest and becoming progressively more complex, and in such a manner that a series of related subjects would be presented, the whole presenting a brief encyclopedic survey of knowledge as well as affording a vocabulary and a working knowledge of simple Latin. This text will give a fair conception of the pansophic ideal as well as the new tendency in the subject matter of education. The 100 different chapter headings included such subjects as these, introduced in the order given: Origin of the World, the Elements, the Firmament, Fire, Meteors, Water, Earth, Stones, Metals, Trees and Fruit, Herbs and Shrubs, Animals (in several chapters); Man, his body, external members, internal members, qualities of the body; Diseases, Ulcers, and Wounds; External Senses; Internal Senses; Mind, the Will, the Affections; the Mechanic Arts (in several chapters); the Home and its parts: Marriage; the Family; State and Civic Economy (in several chapters); Grammar, Rhetoric, Dialectic, and the various branches of knowledge; Ethics; Games; Death, Burial, Providence of God; the Angels. Care was taken that every grammatical structure should be presented so that a complete grammatical knowledge would be developed inductively by the skillful teacher. Each page gave in parallel columns the Latin sentence and the vernacular equivalent, and the instruction dealt with material that, in its elementary form at least, was within the experience of the child. The chief defect of the book, one arising from a violation of a principle emphasized by Comenius, was the failure to repeat the words, the object being to use each word only once. Besides necessitating a vast amount of repetition and arousing the dislike of the pupil, it had the disadvantage of giving only one meaning to the word (though that was always the root signification), and only one construction. While the idea had been suggested by Ratke, and ineffectually executed independently by Batæus, this was the first successful attempt at the construction of textbooks according to modern and psychological principles. And after the improvements made by Comenius himself, little further advance was made for a century and a half. The *Janua* was the work of three years' labor of the author, but in reality it was the product of the centuries since the opening of the Renaissance.

In the same year in which he completed the *Janua Linguarum* he wrote the *Informatory of the Mother School* and the *Schola Infantiae,* books which indicate that his interest in education was not confined to the Latin schools. The idea of the mother school he had embodied in the *Great Didactic.*

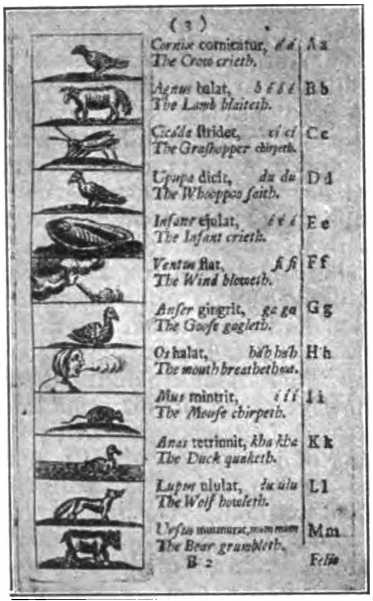
His educational activity was interrupted by a request from the Brethren which resulted in the writing of the *History of the Bohemian Brethren* and *History of the Persecutions of the Bohemian Church,* and several doctrinal works. In 1633 he resumed his earlier work, publishing in that year a *Physics* which gave a synopsis of the physical universe. Although he had come into contact with Bacon's works, this work is ample proof that he little comprehended the inductive or experimental method in science. Theologian as he was by profession, Comenius could not get away from the methods of theology, and his *Physics* shows him employing the methods of analogy and the authority of the Scriptures, which he used where the medieval scholastic philosopher would have referred to Aristotle. For some of the fantastic ideas contained in this work he was indebted to Campanella. The world, he maintained, is constituted from the three principles of water, spirit, light; while the " qualities " of all things are consistency (salt), oleosity (sulphur), and aquosity (mercury). But while theology was responsible for these survivals of the medieval, Comenius distinctly stands for the study of natural phenomena and the dependence upon sense perceptions as the source of knowledge concerning nature. As an easy introduction to the *Janua Linguarum* Comenius wrote in 1633 the *Vestibulum,* or *Entrance Hall,* in which the form of the larger work was retained. The book contained 1000 words combined in 427 simple sentences, and an introduction giving instructions for the use of the work.

From this period dates Comenius' scheme for a pansophic work, a universal encyclopedia, an authoritative statement of all that had been done within the realm of science. This work was to be called *Janua Rerum sive Sapientiae Porta.* The project attracted the attention of Samuel Hartlib (*q.v.*) and some English admirers who were familiar with the *Janua Linguarum.* On Hartlib's request Comenius wrote *Pansophici Libri Delineatio* (*Outline of my Work on Universal Wisdom*), which Hartlib without his knowledge or consent published under the title of *Conatuum Comenianorum Praeludia* (*Prelude to the Efforts of Comenius,* Oxford, 1637), and which was called by Comenius *Prodromus Pansophiae* (*Precursor of Universal Wisdom*). The pansophic idea had been stimulated by Bacon's *Advancement of Learning,* which opened up visions of unparalleled progress. From universalism in knowledge it passed on to universalism in human affairs and gave rise to hopes which Comenius strongly held of a unification of the Christian world. For the present Comenius advocated not only the encyclopedia of natural phenomena, but also a *Collegium Didacticum* or *Pansophicum* which, like "Solomon's House," suggested by Bacon in the *New Atlantis,* was to form a central laboratory and clearing house for all manner of scientific research. Comenius was invited to England to lay his views before Parliament in 1641, but on his arrival found it prorogued. When Parliament met again, everything seemed favorable to the proposed institution. Several buildings in London and Winchester were suggested, and at last Chelsea College was practically decided upon, when the Civil War broke out and diverted all interest. But Comenius did not surrender the hope of reorganizing human knowledge, which with a universal language was to form the basis of a reorganization of society. While this ideal aroused enthusiasm, Comenius was hardly the man to lead in such a work, for he was ignorant of the first principles of research. But this enthusiasm afforded a stimulus to his other work by which he was destined to be remembered, while his ideal was soon forgotten. Although in his *Physics* Comenius had shown himself incapable of appreciating the Baconian method, he displays the extent to which he had advanced beyond some of his contemporaries in the aphorisms included in the *Pansophici Libri Delineatio,* which may be summarized as follows: God, nature, and art are the objects of universal knowledge which to be perfect must be full, true, and ordered. All things originated in accordance with ideas which come ultimately from God; hence the world is an image of God and everything is interconnected. The basis of all things is harmony. Hence Comenius deduces the possibility of knowing all things through apprehending fundamental conceptions and norms by means of induction from natural phenomena, the easiest and most accessible for the purpose of making experiments. (See the Aphorisms in full in Monroe, *History of Education.*)

While in England, he wrote *Via Lucis* (published 1668), supplementing his pansophic plans and suggesting the need of universal schools, language, books, and college. Since the English support could no longer be relied upon, Comenius now decided to accept an invitation to Sweden sent to him by an admirer, Ludovic de Geer, in the hope that there a better opportunity would offer itself of realizing his pansophic ideal, and, if possible, of restoring his people to Moravia. He was soon, however, to be disillusioned, for his interviews with Oxenstiern and Skythe soon convinced him that his services were sought to write school textbooks and not to regenerate the world.

The next few years present a pathetic picture of Comenius struggling to subdue the overmastering desire to do something for his ideal, of angry letters from his patron De Geer, even of charges of dishonesty. But he labored patiently, and in 1646 had completed a series of books which were submitted to a committee of three in Sweden. These books included the *Methodus Linguarum Novissima,* which was a longer work than the *Great Didactic,* and dealt only with the teaching of languages — Latin being taken as a type — and contained a description of the author's own textbooks; the *Januae Linguarum novissima clavis, Grammatica Latino-Vernacula,* a grammar for the *Janua;* the *Lexicon Januale* in Latin; the *Vestibulum, Janua,* and *Atrium,* which were revised and published later.

In 1647 he was selected Bishop of the Brethren, and for the next few years he devoted himself to his clerical duties in addition to his other work. He had several invitations to reorganize school systems, and in 1650 he established a school at Saros Patak, near Tokay, which, in addition to giving Comenius a free hand at putting his ideas into practice, was to be equipped with a printing press. For the organization of this school he published the *Sketch of the Pansophic School.* While at Saros Patak he remodeled the *Vestibulum* and added a list of words in the vernacular and Latin, for Comenius had now decided that words should come before sentences. The *Janua* was also rewritten and included a lexicon of words, a grammar and text in this order, certainly not an improvement on his first edition, which, however, he repudiated. He now began to justify his method by the analogy of building — first the word, then the tools for shaping it, and last the structure. The third textbook was the *Atrium Linguae Latinae* to which a complete Latin grammar is prefixed. The text is an enlargement of that of the *Janua*, and prepared for the *Palatium* or *Thesaurus* of works selected from the classical Latin writers. In this period falls the *Orbis Pictus*, or the *World in Pictures*, which was to enjoy greater popularity than any other of Comenius' writings and was to create a new departure in school textbooks. The full title was *The World of Sensible Things drawn; that is, the Nomenclature of all Fundamental Things in the World and Actions in Life reduced to Ocular Demonstration, so that it may be a Lamp to the Vestibulum and Janua of Languages.*" This was probably the first successful application of pictures to school uses. The use of pictures naturally arose from Comenius' advocacy of things before words; when the things could be used, so much the better; otherwise, pictures could take their place. *Nihil in intellectu quod non prius fuerit in sensu.* In the preface to this work he says: " For it is certain that there is nothing in the understanding, which has not been previously in the sense; consequently to exercise the senses carefully in discriminating the differences of natural objects is to lay the foundation of all wisdom, all eloquence, and all good and prudent action." He had already recommended that the classroom walls should be covered with pictures. The cuts were executed by Michael Endter of Nuremberg. Each object in the pictures was accompanied by a number, and the name was given in the text in Latin and the vernacular. Another experiment of this period, all inspired by the same purpose to objectify the lessons, was a dramatized version of the *Janua*, the *Schola Ludus*, which according to Comenius was greatly enjoyed by the pupils who took part and by the parents who witnessed the performances. Two other interesting works formed part of the scheme of organization — the *Precepts of Manners* (*Praecepta Morum*) and *Laws of a well-ordered School* (*Leges Scholae bene Ordinatae*), — the one dealing with rules of behavior to be expected from boys, the other with principles of school and classroom administration.



(3)

Cornix cornicatur, *á á* Aa
The Crow crieth.

Agnus balat, *b é é é* Bb
The Lamb blaiteth.

Cicada ſtridet, *ci ci* Cc
The Graſhopper chirpeth.

Upupa dicit, *du du* Dd
The Whooppoo ſaith.

Infans ejulat, *é é é* Ee
The Infant crieth.

Ventus flat, *fi fi* Ff
The Wind bloweth.

Anſer gingrit, *ga ga* Gg
The Gooſe gagleth.

Os halat, *hàh hàh* Hh
The mouth breatheth out.

Mus mintrit, *í í í* Ii
The Mouſe chirpeth.

Anas tetrinnit, *kha kha* Kk
The Duck quaketh.

Lupus ululat, *lu ulu* Ll
The Wolf howleth.

Urſus murmurat, *mum mum* Mm
The Bear grumbleth.

B 2 *Felis*

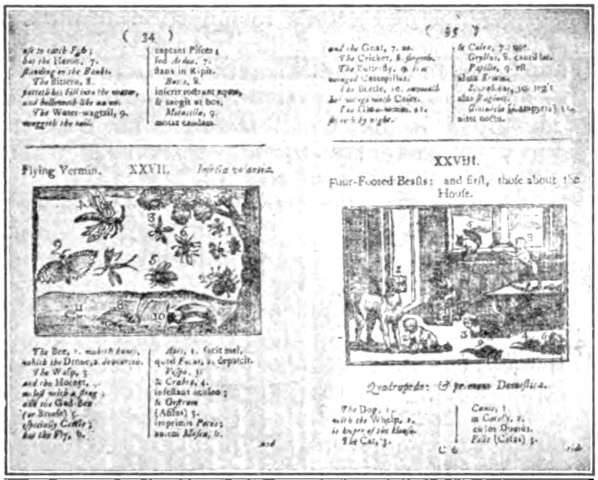
A page of the alphabet from the *Orbis Pictus*.

In 1654 Comenius took leave of the school at Saros Patak and returned to Lissa, where he again plunged into his pansophic work, buoyed up still more by renewed prophecies of the speedy restoration of the Moravians. His superstitions led him into indiscretions, and when the war between Poland and Sweden broke out, the Moravian community was scattered by the Polish army and Comenius' library was destroyed by fire, including what he regarded as his most precious possession, a *Silva*, or collection of materials on which he had worked for twenty years for his complete Pansophic treatise. Fortunately Comenius found a home at Amsterdam under the protection of Laurence de Geer, a son of his former patron. Here he began a revision of his works for a new edition, wrote an addition to the *Vestibulum* under the title of *Auctarium*, a collection of sentences made up of root words and intended to bridge the gap between the *Vestibulum* and the *Janua*. While at Amsterdam, he was attacked for his Latinity — probably the most vulnerable point in his works — and defended himself in the *Pro Latinitate Januae Comenianae Apologia*. To guard against further attack he wrote a severely critical account of his method in the *Ventilabrum Sapientiae sive sapienter sua retractandi Ars* (*The Fanner of Wisdom, or the Art of wisely retracting one's own Opinions*). In 1657 he published a collected edition of his works in four parts under the following title: *J. A. Comenii Opera Didactica Omnia, Variis hucusque occasionibus scripta, diversisque locis edita; nunc autem non tantum in unum, ut simul sunt, collecta, sed et ultimo conatu in Systema unum mechanice constructum, redacta. Amsterdami Impensis D. Laurentii de Geer. Excuderunt Christophoros Cunradus et Gabriel a Roy. Anno 1657.*

With the publication of his collected works Comenius retired from what he regarded as the disgusting task of writing school books (*Latinitatis studia mihi toties nauseata*), and was encouraged by De Geer to continue his pansophic labors. At the same time he devoted more and more attention to the prophecies and chiliastic hopes, writing a collection of prophecies which he had heard, under the title of *Lux in Tenebris*, followed in 1663 by an up-to-date edition called *Lux e Tenebris*. These works brought him into theological controversies in which he was frequently worsted and finally held up to ridicule and contempt.

Lack of funds prevented much progress on the pansophic work, but in 1666 he completed a *Janua Rerum* which was published in 1681, a metaphysical treatise which embodied the notions of his youth and shows no trace of the influence of inductive reasoning. The last few years of his life were embittered by attacks on his faith in prophecies, which went beyond academic controversy and were directed against his personal character. Comenius died on Nov. 15, 1670, and was buried at Naarden, near Amsterdam.

It remains to give some account of the work which has secured for Comenius a lasting place in the history of education, which in parts was so far ahead of its time as to appear prophetic. This work is certainly one of the most remarkable educational treatises ever composed. Though essays or books on didactics were among the most numerous of the publications of those times, the *Great Didactic* is a remarkable variant from the ordinary type. Both its ideas, or principles, and its arrangement are strikingly modern. On the contrary, the form in which the ideas are expressed, as well as the particular interpretations of the method used, are thoroughly colored by the theological character of the age and by the professional training of the author. So sane and far-seeing are the precepts of this work that it may even yet be read with greater immediate profit to the teacher, sufficiently intelligent to avoid many minor errors, than the majority of contemporary educational writings. Some of the main principles of the *Didactic* were embodied in the textbooks, and a solid foundation is laid for the educational development of the succeeding centuries.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Flying Vermin. XXVII.

XXVIII.

Four-Footed Beasts: and first, those about the House.

A page from an early English edition of the *Orbis Pictus*.

The purpose of education is to foster man's inborn tendencies to social life, to acquire knowledge, and to look to God. All human beings are equally entitled to an education without distinction of rank, sex, or ability. The duller pupils require more help than the bright. As for women, they are as capable as the men, and in fact "the more we occupy their thoughts, the less will there be place for the rashness which springs from empty minds." The end of education is social that man may acquire a knowledge of the good, and thus "every one will know how to prepare himself for all the actions and desires of life, within what bounds he shall advance and how his present situation shall be secured." Men need education "that they may be men." Hence the State must undertake to provide schools of different types to afford education up to the age of 24. In the primary stages up to 12, education must be universal and compulsory. Four types of schools are required: The *School of Infancy*, or the Mother School, for the first six years of childhood; instruction here is to be given in the family by the mother in external things, employing also the aid of pictures. Here the beginnings are to be made with those subjects which will be developed more fully on the concentric method in later years: metaphysics, *i.e.* familiarity with general terms and causal relations, physics, *i.e.* knowledge of natural objects around him, optics, astronomy, geography chronology, history, arithmetic, geometry statics, mechanics, dialectic, grammar, rhetoric, economics, polity, morality, religion, and piety. By these high-sounding terms Comenius meant little more than that the child should be given opportunities of expressing himself and of learning something about his environment. But from the foundation thus laid each subject would be expanded in future years on the concentric method.

After the mother school comes the Vernacular School for pupils from 6 to 12. Such a school ought to be established in every little village and association of human beings. The general aim of this school is to develop the inner senses, imagination, and memory, and to train the intelligent citizen. Here the opportunity is given to all human beings to be instructed in all those things that have to do with human affairs. Hence a common minimum is established. With the vernacular school closes the education of those who are intended for the workshop. Boys of ability are to be encouraged to proceed further to the Latin School or Gymnasium for pupils from 12 to 18. Such schools should be established in every city. It is interesting to notice that Comenius had insisted on a system of scholarships as a condition of his undertaking the work at Saros Patak. It is highly probable that he had this in mind in the *Great Didactic* when he suggested that no intelligent scholar should be refused admission to the Latin School merely on account of poverty. The higher school is to train the intellect and judgment. The six years of the course are crowded to the full by the great range of subjects, including the seven liberal arts as well as physics, geography, chronology, history, ethics, and theology. It is a striking feature that Comenius, reformer though he was, could not bring himself to revolutionize the curriculum; hence the new was added to the old, with the result that the burden was increased and there arose a danger that the pupils would merely get a smattering of the numerous branches of the proposed curriculum. At the end of six years an examination was to be held and only the best students were to be permitted to proceed to the national academy or university, the institution for the training of professional men and scholars. Here, too, the course was to last six years. The students were to be inspected by outside commissioners, and degrees were to be awarded only to the worthy. The crowning institution of all was to be the *Collegium Didacticum*, the College of Light, framed in accordance with the author's pansophic ideals.

Throughout Comenius never forgets the care of bodily health and recreation. The school day should be one of four hours, so that pupils should have time for recreation and domestic work, if necessary. The morning hours of the school program were to be devoted to those subjects which exercise the memory and understanding, and are accordingly more fatiguing; the afternoon was to be given to subjects which employ the voice and hand. The schools were to be divided into one class for each year, each class having its own textbooks. Care was to be devoted to the school and classrooms to make them attractive. The discipline was not to be as harsh as was usual in those days; severe punishment should be inflicted only for moral offenses. "When a musician's instrument emits a discordant note, he does not strike it with his fist, or with a club, nor does he bang it against the wall; but continues to apply his skill to it, till he brings it to tune." How modern many of the ideas, contained in this great work of the sixteenth century are, need not be pointed out. Compulsory education, a recognized curriculum appealing to every side of human interest, organized schools and classes, an educational system with an educational ladder, the opening up of opportunities to intellect, milder discipline, physical exercise, moral training, — all these are found in the *Great Didactic*, ideas which have in part been realized but recently, in part still continue to be advocated.

Psychologically, however, Comenius was not ahead of his time, though he was familiar with the best that was thought on the subject. That he was a sensationalist goes without saying; to empiricism he added a faculty psychology, with the faculties arranged in a kind of hierarchy, so that one could not be trained before the other. "It is lost labor to try to form the will before the understanding, or the understanding before the imagination, or the imagination before the senses." But whatever his psychology, Comenius was the first who made any attempt to apply that science to teaching; his method was psychological rather than logical. But to this he also added the method of analogy, and so he turned to nature, from which he drew twenty-nine principles of method to help children to learn "quickly, pleasantly, thoroughly." From these natural principles he extracted principles of method which have not been improved upon in modern times, although they may have been established on a better foundation. In Chapter XIX, 20, there is a foreshadowing of the apperception and interest theories. Since his method was the natural method, Comenius held that it was the universal method; hence the teacher could prepare himself by properly learning this. With this method and uniform textbooks one teacher could instruct a class of any size. "The sun is not occupied with individual objects, tree or animal, but lights and heats the whole earth." Here too he did not move ahead of his contemporaries. The aim of the age was to discover universal principles as a means of unbounded progress. Comenius developed his universal principle in education, and he cannot be blamed for falling into the enthusiasm of the time. What success he would have achieved, had he understood the significance of Bacon's formulation of the scientific method, it is difficult to say. The remarkable fact is that he attained so much on *a priori* reasoning, for the principles which he developed in his *Great Didactic* he tried to apply consistently to his textbooks which achieved so much success.

Whether considered from the point of view of theoretical writings or from that of direct treatment of schoolroom problems, Comenius is one of the most important representatives of the realistic movement as well as one of the leading characters in the history of education. Indeed, the most scholarly of his recent biographies expresses the judgment that Comenius is "the broadest-minded, the most far-seeing, the most comprehensive, and withal the most practical of all the writers who have put pen to paper on the subject of education; the man whose theories have been put into practice in every school that is conducted on rational principles, who embodies the materialistic tendencies of our 'modern side' instructors, while avoiding the narrowness of their reforming zeal." However, this panegyric contains an exaggeration, in that, while the writings of Comenius deserve all of this encomium, his actual influence on his own and following generations was slight save in one respect, — that of a more scientific method of teaching the languages as embodied in his textbooks. For almost two centuries even the very knowledge of these most important educational writings ceased to exist; consequently, they had little or no direct influence upon later educational reformers. It is true that Comenius' ideas "have been put into practice in every schoolroom conducted on rationalistic principles," but altogether aside from any influence exercised by Comenius; for a knowledge of Comenius and his writings was not possessed by those who practiced his principles. The greatness of Comenius consists more in his early formulation of those principles in concrete terms, than in his direct influence in the introduction of such principles into subsequent educational practice. After his own generation, it was not until near the middle of the nineteenth century that these remarkable educational writings of Comenius were again called to public attention by the early German historians of education, and consequently that due recognition has been given to the place of Comenius in educational reform. His ideas of education were similar to those of Ratke, to whom, however, on account of the secrecy and charlatanism of his method, Comenius owed little or nothing, save the suggestion of a "natural" method. But these ideas, common to both, were worked out into a far more extensive scheme and in much greater detail by Comenius. They were more consistent, more logically presented, and far more modern than were those of the earlier innovator. I. L. K. and P. M.

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COMES, NATALIS, or COMITIBUS, NATALIS DE.—An Italian writer who published in 1551 his *Mythologiae, sive Explicationis Fabularum, libri decem.* In a Geneva edition of 1620 this work, together with the same author's *De Venatione,* takes up 1125 octavo pages, not counting an extensive index, all in Latin. The work is a comprehensive dictionary of mythology, Greek and Latin, and contains a full account of writers on mythology, confining itself to pre-Renaissance writers. He quotes from over 600 authors, and, as he gives copious quotations, the work presents the appearance of a vast anthology. The schoolboy or student was thus introduced to accounts of the ancient gods, goddesses, and mythical personages in the very words of ancient writers (Greek and Latin). This intimacy in the use of the old classics was an excellent training in translation, and afforded abundance of material for themes and verses. Moreover, it was a vast object lesson in the art of making of commonplace books (a favorite method of instruction in the old grammar schools, throwing activity of search on the boys themselves), which could be applied in other subjects besides mythology. There is also to be found the treatment of mythology as symbolism. It is altogether a remarkable production, showing the immense patience, labor, and resources of the old Post-Renaissance scholars, which penetrated gradually into the classrooms of the old grammar schools. Charles Hoole, in the *New Discovery of the Old Art of Teaching School* (1660), recommends Natalis Comes for use in the fourth form of the English grammar school, as supplying pupils with fit epithets, phrases, apophthegms for themes and verses, etc., and names Natalis Comes along with the following for this purpose: Sandys' translation of Ovid, Alexander Ross's *English Mythologist;* Francis Bacon's *De Sapientia Veterum,* Verderius' *Imagines Deorum,* and the like. These are to be kept in the school library for reference, "to invite them like so many bees to busy themselves sucking up matter and words to quick their invention and expression." F. W.

COMMENCEMENT. — Historical Development. — A term used in American universities and educational institutions in general for the exercises connected with the conferring of degrees. It was borrowed from the similar use at Cambridge, when it was equivalent to the medieval term, "inception" (*q.v.*). The first commencement exercises were held at Harvard University in 1642 on the second Tuesday of August. On this occasion the degree of Bachelor of Arts was conferred on nine candidates. The ceremony was in the early days attended by the governor, judges, and other executive officials, by ministers and other men of note. A procession was formed, consisting of the corporation, overseers, guests, and students, and moved from Harvard Hall to the old Congregational church at Cambridge, where the exercises were held. The president opened with a short prayer; a member of the graduating class gave a salutatory oration in Latin; then there "were Latin and Greek orations and declamations, and Hebrew analysis, grammatical, logical, and rhetorical, of the psalms; and their answers and disputations in logical, ethical, physical, and metaphysical questions; and so [the candidates] were found worthy of the first degree (commonly called bachelor) *pro more Academiarum in Anglia.*" The degree was conferred with the permission of the overseers by the president, who placed a "book of arts" in the candidate's hand and pronounced a Latin formula. A dinner was then given in Harvard Hall, and in the afternoon the procession returned to the church where the degrees were conferred on the masters. Commencement Day was always accompanied by great festivities and rejoicing, which in the seventeenth century developed into excesses, just as the inception at the University of Paris had done earlier. Sumptuary laws were passed in 1722 prohibiting commencers from "preparing or providing either plumb cake or roasted or baked meats, or pies of any kind" and from having in their chambers "distilled liquors or any composition made therewith." But no amount of supervision could check the disorder until late in the century. Attempts were made to hold private commencements without announcing the day or date until actually necessary, but protests were made not only by those who were concerned as candidates or guests, but also by the people of Boston, who regarded and kept Commencement Day as a general holiday. The private ceremonies only were held during the Revolutionary period.

The commencement exercises at Yale College were very similar. Its first commencement was held at Saybrook on Sept. 16, 1702, when the degree of Master of Arts was conferred on four Harvard men and one candidate received the degree of Bachelor of Arts. The first ceremony at New Haven was held in September of 1717, when the degree of Bachelor of Arts was conferred on five students. The first public commencement was held in September, 1718, when the Governor and several executive officers were present. The same form of ceremony was employed as at Harvard. President Clap gives the following account of its celebration during the middle of the last century. "The public Commencement is ordinarily on the second Wednesday in September annually: at which there is a large assembly, consisting of the President and Fellows, a great number of Ministers, and other learned and superior gentlemen. The President begins the solemnity with prayer, one of the candidates for the first degree makes a salutatory oration to the Governor and Council, the Officers of College, and the whole assembly: the others give a specimen of their learning, by disputing syllogistically on the questions printed in their theses; which are then distributed. The like is done in the afternoon by the candidates for the degree of Master of Arts. Then the President, with the consent of the Fellows, gives them their degrees, three at a time, in this form: *Pro auctoritate mihi commissa, admitto vos ad Primum Gradum in artibus; pro more Academiarum in Anglia. Vobisque trado hunc Librum, una cum potestate publice praelegendi, quotiescunque ad isthoc munus evocati fueritis: cujus haec instrumenta, membrana scripta, testimonio sint.* The like form is used for the Masters, only instead of Primum, it is Secundum: and instead of praelegendi, it is profitendi; and sometimes, instead of Primum, the President says, Gradum Baccalaureatus; and instead of Secundum, he says Gradum Magistralem. Then one of the Masters makes a Valedictory Oration: and the President concludes the whole solemnity with a prayer."

Present Condition. — In the present commencement are represented several academic principles or practices. (1) Administrative action. The most important meeting of the Board of Trustees is held at this time. Election of professors is made and academic policies are adopted. (2) Conferring of degrees. These degrees are both ordinary, representing scholastic merit, and honorary. These degrees are conferred in public, and the granting is usually accompanied with much éclat. (3) The baccalaureate. This term has come to stand for the sermon on religious or ethical address which is given to candidates for degrees the first Sunday of Commencement week. Although usually given by the president or college pastor, it is not infrequently given by a specially invited clergyman. The theme chosen is commonly broadly religious, allowing personal application of its truths to the candidates for degrees. (4) Commemorative. In the commemoration are involved at least three parts. (*a.*) The history of the academic year which is closing. This history is usually presented in writing by the president, and sometimes orally. (*b.*) Graduates and former students return to pay respects to their *alma mater*. Classes in particular return for their triennial, decennial, and for their twenty-fifth and fiftieth anniversaries. (*c.*) *De mortibus*. Each college has a necrologist who presents either in print, or orally, or both, a record of graduates who have died in the preceding year. (5) Academic speeches. These speeches are of one of two sorts — made either by graduates of the year or by an orator called from outside academic walls. The speaking by graduates, although less common than formerly, is continued by many colleges. In this process there is a certain degree of reason. The delivery of an oration indicates how well or how ill the orator thinks, and to think is a comprehensive purpose of the college training. The delivery of an oration may speak much for the character of the orator, and to form a noble character is a comprehensive purpose of a college training. But the public orator, called for the occasion, represents a more usual present method of academic speech. He represents a broad field of utterance. Any one of the many relations of the college — scholastic, administrative, professional — he regards as a proper theme for discussion. Public questions — political, literary, sociological — are also frequently presented. Commencement oratory is, with the exception of political and clerical, the most important in America. (6) Social festivities. A graduating class, as a class or through divisions, or by individual members, sets forth many social privileges. Dances, dinners, "spreads," dramatic entertainments, concerts, are the more usual forms. "Class Day" is the special term applied to the opportunities thus given. At Harvard, for instance, Class Day has great historic social significance. (7) A holiday. For the whole college or university, and for the neighborhood in which it is situated, especially if that neighborbood be rural, commencement is a holiday season.

In most colleges commencement occurs once a year and in the month of June. But certain institutions, notably the University of Chicago, hold commencement four times each year. Although in a narrow sense commencement represents a single day, in a broader sense it covers in many colleges an entire week.

C. F. T.

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COMMERCIAL EDUCATION. — General Survey. — Commercial education is now generally understood to include all education which prepares specifically for business careers. It is no longer limited to the narrowly technical or practical training which fits the student to perform the various operations that are necessary in the exchange of commodities, but it is generally taken to exclude the training that prepares for the work of production. With the practical training there is usually associated a certain amount of the liberal, or cultural, element of education. The proportion of this element differs widely in the almost innumerable forms of commercial education found in the United States and in foreign countries. In some it is practically nil; in others, it comprises over nine tenths of the whole amount of time given to study.

Recognition of this branch of education has been somewhat tardy, and can hardly be said to be complete even now. One reason for this is obviously the fact that a century ago the transaction of business was a simple matter compared with the complexity of our present organization. Commercial life itself was not very highly developed, and was, indeed, considered too humble a form of activity for the exercise of great talents, or for any special preparation. All this has been changed now. Commerce has so extended its sphere, and has so developed its organism that it has become the field for the greatest intellects. Thorough preparation for it has become recognized as necessary, though there are still great divergences of opinion as to the form this preparation should take. Until recently it was not thought to be a function of either public or private schools — a function of education, in the sense the word was used. For that matter, the very combination of words "commercial education" is somewhat anomalous. Opposition to the conjunction came from both elements. The ideals of education and of business were regarded as directly opposed. The earnestness with which educators opposed the introduction of the commercial aim, or commercialism, into their methods is only paralleled by the cordiality with which the majority of business men condemned the aims and methods of education as impractical and useless for their purposes. Within the past quarter century utterances by each party to the detriment of the other have been frequent, but they are nearly silent now. Recognition of commercial education has come, and the two warring elements have been partially reconciled. That they have been brought to realize the essential unity of their interests and their mutual helpfulness is not the least important advance made by education in the past quarter century. For, although the recognition of commercial education has been tardy, and although it is still in an experimental stage, its growth has been rapid enough to leave no doubt of its usefulness. If the figures were not in themselves sufficient proof of the fact that commercial education has grown in response to a real need and a real demand, it would be only necessary to examine its early history both in this country and abroad.

History in the United States. — The beginning of commercial education in the United States was characteristically American. It was a growth, not an institution — a growth of private enterprise in response to public need. It was spontaneous, and several early forms were almost simultaneous. All were in answer to definitely voiced demands. In the early part of the last century there was practically nothing in the way of instruction to prepare for business life. Boys who looked forward to business careers left school early and entered stores or offices, where they served apprenticeships. of greater or less duration. Here they learned such bookkeeping and business methods as were then in vogue. The quality of instruction they obtained depended, of course, on the employer. There was small opportunity for comparison or improvement of methods, and progress was slow, individually and collectively. Even this meager instruction was not to be obtained by all. The increasing importance of commerce attracted more men than the offices and stores could train; and this training, moreover, was too slow for those who had already reached manhood. Mr. R. M. Bartlett, one of the pioneers in commercial education, has related his unsuccessful efforts to obtain instruction in bookkeeping. His experiences were probably like those of many other young men. Their demand was unheeded by the public and private schools then in existence. As it increased, private schools and classes in bookkeeping sprang up in all the principal cities of the country, somewhere between 1830 and 1840. These private schools, formless and unsystematic as they were, gave the first commercial education and were the forerunners of the modern business schools, now numbering over 2000, that are found in every important city in the United States and that have over one half the total number of students receiving commercial education of any kind.

To whom belongs the honor of the first venture in commercial education is a matter of some dispute. It has frequently been attributed to the above-mentioned R. M. Bartlett of Philadelphia, who established a school there in 1843 to provide the substitute for apprenticeship, of which he had himself felt the need. By others the honor is claimed for James Bennett, a New York accountant, who seems to have conducted a private school, in which bookkeeping and navigation were the principal subjects, some time between 1818 and 1836. The exact date when the school was begun is not known. James Gordon Bennett, with whom James Bennett is frequently confused, announced a school of this kind in 1824, but it is doubtful if it was ever established. Other early schools were founded by Peter Duff of Pittsburg, George N. Comer of Boston, and Jonathan Jones of St. Louis. Most of these early schools had bookkeeping as their foundation subject. There were some, however, of slightly different origin. They were begun by itinerant penmen, such as Silas S. Packard and Platt R. Spencer, who formed penmanship classes in various cities. From these classes schools often sprang up. The number of these business schools seems to have increased with more rapidity than their quality. Penmanship and bookkeeping were still the main subjects, with frequently the addition of commercial arithmetic and commercial law. Later stenography and typewriting came in. But in general the instruction given was purely technical and along narrow lines. Practical utility rather than cultural value was sought. The instructors were frequently men of deficient education, especially in English composition, and in many cases encouraged extremely mechanical methods of work.

What was more serious, the aims of education were often defeated by too great an influence of the money-making spirit in the management of the schools. Energetic and resourceful men established chains of business schools in a number of cities throughout the country. These they placed in charge of young men as managers, who were to share in the profits. The most important of these chains was that established by H. B. Bryant and H. D. Stratton, whose efforts began in 1853 and resulted by 1863 in a strong combination of schools, to the number of fifty or more, all under their general management. So successful were they that about 1866 they made an attempt to monopolize the field of commercial education by crushing all competition of other business schools. Internal dissensions and opposition by the managers of many of their branches, and the failing health of Mr. Stratton, the real director of the organization, made this plan impossible of execution. Other associations of commercial schools were begun in 1866, but none rose to the commanding position enjoyed by the Bryant and Stratton chain in the early 60's. The intense competition which followed was productive of as great evils as the monopolistic system. Special inducements were offered to part-time students. In some cases the only requirement for entrance was the necessary fee. Vast sums of money were spent in all kinds of advertising. Brass bands, stump speeches, and penmanship exhibitions at county fairs and the like were among the schemes resorted to by some of the aggressive " educators." It is not surprising, in view of this, that there were many charlatans in the field, and that the work suffered accordingly. In spite of the evils, the schools grew in number and in size with astonishing rapidity. They furnished training that was not to be obtained elsewhere, and served an extremely useful and necessary purpose. From an enrollment of at most a few score students in 1840 they increased in half a century to more than 100,000. Their instruction still remained vocational, but it had become more broad and thorough, and it was always practical. They had arisen to fill a need, and their success shows that they did accomplish the end they sought; namely, the preparation of men for business careers. In 1893, according to the United States Bureau of Education figures, there were 115,748 students enrolled in private commercial and business schools in this country. The number was probably much larger, in reality, for many of the smaller schools failed to report each year. Moreover, the fact that most of the private business schools called themselves " business colleges," and that some of them reported to the Bureau under the head of colleges, caused some confusion in the figures. After 1893-1894, the enrollment in the private commercial schools diminished for several years. This was due partly to general business depression. But another reason may be found in the fact that the private commercial schools were subjected to stronger competition from other sources. Public high schools, normal schools, and universities were offering commercial instruction. Some of them had done this even earlier. The Wharton School of Finance and Commerce was instituted in the University of Pennsylvania in 1881. A number of Public High Schools about the same time offered two-year courses for commercial students. But they had not proved very serious competitors up to 1893-1894.

In that year United States Bureau of Education statistics showed only 15,220 students pursuing commercial studies in public high schools, and the total in institutions other than private commercial schools was not much larger.

It was about this time that the new era of commercial education began in the United States. The years from 1892 to the present have been full of development and improvement, and the real history of commercial education in the United States may be said to be included within this period. In 1890 Professor Edmund J. James of the Wharton School in an address before the American Bankers' Association expressed his belief in the value of the university school of commerce and his ideas of what it should include. In 1892 he made a plea for the establishment of separate commercial high schools. In 1892 also, the Business Educators' Association, organized in 1878 in New York, and composed of teachers in private commercial schools, for the most part, became the Department of Business Education of the National Educational Association. In 1894 it held its first meeting at Asbury Park, and soon exerted a marked influence in systematizing and improving the work of the private commercial schools. It has also had a great deal to do with the improvements in commercial education in public secondary schools.

Until about 1900 progress was slow, so far as outward developments in commercial education are concerned, but a great deal was being done in a silent way both by educators and by business men all over the country. As was stated above, the private commercial schools had a period of decline after 1894. In 1898–1899 their enrollment was reported to be only 70,186. But with the opening of the new century they regained the former level, and from that time until 1908 steadily increased in number and in quality of instruction. In 1904–1905 the number of schools reporting to the United States Bureau of Education was 523, with 146,086 students enrolled. In 1907–1908 there were 558 schools, reporting 154,963 students; and in 1908–1909 there were 574 schools, reporting 146,288 students. The following year showed a further decrease to 541 schools with 134,778 students. Since the beginning of the century other lines of commercial education have shown even greater and steadier development. This development does not appear in the statistics of the Bureau of Education, from which it would seem that nearly 12,000 students were pursuing commercial studies in universities and colleges in 1905–1906, against less than 6000 now. This is due, however, to the above-mentioned confusion caused by private business schools reporting under the head of colleges until the last few years. At present a more rigid classification is made, and the figures are more reliable.

The complete statistics of the United States Bureau of Education for 1909–1910 showed the following conditions in the various branches of commercial education : —

CLASS OF INSTITUTION	NUMBER OF SCHOOLS	STUDENTS		
		MALE	FEMALE	TOTAL
Universities and colleges	66	5073	727	5800
Public and private normal schools	34	797	825	1622
Private high schools and academies	540	5753	4438	10,191
Public high schools. . .	1440	35,155	46,094	81,249
Commercial and business schools	541	72,887	61,891	134,778
Total	2621	119,665	113,975	233,640

The Private Commercial School. — Even with the growth of other forms of commercial education, the private commercial schools still occupy a very important and necessary place, and will probably continue to occupy it. In aims and methods they differ little from the earliest schools of the kind: they still give vocational instruction, a substitute for apprenticeship. Every year they train hundreds of thousands of young men and young women in the use of the tools of the business professions. The only real differences now are in the number of tools and in the quality of instruction. The earliest schools taught chiefly bookkeeping and penmanship: those of the present time include not only these, but also commercial arithmetic, commercial law, correspondence, business forms, typewriting, shorthand, and sometimes others. Some schools give instruction in geography, spelling, and the like, but these are usually for the purpose of supplying deficiencies in preparatory training, rather than for any cultural value of their own. The scope of instruction in the best of the private business schools is indicated by the following suggestive outline, which was prepared by a committee of the Department of Business Education of the National Educational Association in 1895 and published by the United States Commissioner of Education in 1898.

Mathematics, (*a*) Bookkeeping, (*b*) Arithmetic.

Writing, (*a*) Penmanship, (*b*) Shorthand, (*c*) Typewriting.

Business, (*a*) Business Practice, (*b*) the History of Commerce, (*c*) Commercial Geography.

English, (*a*) Spelling, (*b*) Grammar, (*c*) Business Correspondence, (*d*) Composition and Rhetoric, (*e*) Public Speaking.

Civics, (*a*) Commercial Law, (*b*) Civil Government, (*c*) Economics.

In this suggested curriculum, bookkeeping was regarded as the foundation study. As a matter of fact few schools give instruction in all the courses in this list, but that is largely because of lack of demand from the students. They usually desire only the more technical work.

Students who are graduated from these schools usually have sufficient mastery of the tools to enable them to earn a livelihood immediately. Many of them have attained high positions in the business world. The competition between the schools in large cities has been keen enough to raise the standard of instruction very decidedly, and the best of them now give a thorough and practical training in commercial subjects — a better training, indeed, than is given by the majority of public high schools along these lines. In addition, the worst evils of charlatanism have been eliminated. Aside from the somewhat narrow and technical character of instruction, the worst fault that still remains is in the mechanical methods that are used. There is too great an insistence upon rules, and too little upon principles. This fault is due to the very virtue of the schools, their practicality, which looks no farther than an immediate result. The performance of tasks rather than the solving of problems is the end that is sought. Similarly, externals are frequently regarded as of too great importance. The correct slant and uniformity of letters are high ideals to be gained. Of course it is true that many business men demand that kind of mechanical excellence in their subordinates rather than brains and initiative. Still it must be said that the commercial education of the private business schools is far from educational in its true sense. It trains the mind, but does little to develop it. In fine, these schools must be regarded only as trade schools. The frankest of them do not attempt to deny this fact. Instead they agree that this is their distinctive function, and claim that it is very necessary. They accomplish the results they aim at more completely than any other schools can. Whenever there is no longer a demand for this kind of training they will change their character, since they are forced to be self-supporting. But for present needs in vocational training they are sufficient. It is too much to expect that these schools will ever again lead the way in commercial education, but it is certain that they will not be slow to meet the new demands that are arising daily. Their existence depends upon it, and experience has already taught its lesson.

The Public High School. — Commercial education in the public schools is still in the experimental stage. It has never been conspicuously successful, nor has it until recently been of a kind that promised much advance from the private commercial schools. It has made its way with difficulty, and there is still a good deal of suspicion and some antagonism directed against it. In its history, the weakness of our public educational system is made apparent. In the first place, our educational system has nothing of the compactness and unity of those of many foreign countries, notably Germany. Control is so largely local that there is difficulty in instituting a new movement with any degree of unanimity. Much time and energy is wasted by the several states and cities in making experiments, and much more time is lost in waiting for others to make the experiments. It was with difficulty that even such so-called "innovations" as music, drawing, and physical training obtained recognition as desirable factors in public school education. In a similar way, the introduction of commercial studies was retarded by the lack of any unified system, and the general conservatism of educators. Another objection was that there was no place for it. In the primary schools it was of course out of the question. The secondary or high schools were generally regarded as stepping stones to college, and were dominated by the classical element. Certainly commercial studies were not academic. And although only a small part of the students in the high schools went to college, it was felt that even those who did not should be given a substitute in the way of culture, so far as possible. There was no room for practical or vocational instruction. Nor were there any properly equipped teachers.

But the demand became too insistent to be unheeded. Many students left the public high schools early in their course to enter the private business schools, where they might obtain preparation for their future careers. Naturally there was some murmuring on the part of taxpayers, who felt that the public schools they paid for should give the education for which their sons and daughters asked, whether it looked toward a professional or a business career. Scientific courses were given in most of the larger high schools — why not commercial? In response to the demand, short commercial courses, of two years (and sometimes of only one) were offered in many high schools before 1890. The movement rapidly extended throughout the country. In 1893 there were 15,220 students in the United States in these courses; in 1895, there were 30,330. In the years 1893–1899 their numbers increased, while the enrollment of the private business schools decreased. This might seem to indicate that the courses were successful and were a good substitute for the private commercial school courses. Such was far from being the case. The majority of them were poor; some were bad. They had come because the demand was too strong to be resisted, but they had little encouragement from above. The public educational system had simply accepted them as a necessary evil, and had slavishly imitated the private schools. The methods and the quality of instruction were inferior. There was little attempt to relate the cultural to the practical studies. A few new and alien branches had been grafted on an old tree, but they were poorly nourished by it and did not grow. The short commercial course in high schools was distinctly not a success, and began to fall into disrepute. The work of its graduates was compared unfavorably with that of regular four-year students. The private schools improved to meet the new competition, and far outstripped the public school courses, hampered as these were by all manner of difficulties. This is seen in the statistics of attendance. As has been said, the number of students pursuing commercial courses in the public high schools increased in 1893–1898, while that in the private commercial schools decreased. In the next five-year period, 1898–1903, both increased at about equal rates. In 1903–1908 the public high school enrollment in commercial courses seems actually to have decreased, while that of the private commercial schools increased. Doubtless the decrease was not so great as the government statistics make it appear, because of a change in the method of reporting. Indeed, the average number of students in the well-established commercial courses in public high schools has shown a fairly steady increase every year. For all that, the public school has not been a successful competitor of the private school in the latter's own field of short courses and purely technical training.

Within recent years, however, a movement has begun which promises to place commercial education upon a stable basis in our public school system. In many of the larger cities of the country since 1900 separate high schools of commerce have been established. As early as 1892, far-sighted educators saw the necessity of this, if commercial education were to be successfully undertaken. In that year Professor Edmund J. James, then of the Wharton School in the University of Pennsylvania, in a notable address before the convention of the American Bankers' Association at Saratoga, made a plea for the establishment of separate commercial high schools. Interest in the proposition grew, and although it was some time before results showed, there was a general tendency to lengthen and broaden the commercial courses then given in the public high schools. In 1898 the Central High School of Philadelphia founded a separate commercial school with an entirely distinct curriculum. Soon after, the High School of Commerce in New York was opened. Others followed in Pittsburg, Chicago, Brooklyn, Washington, and other cities. In the majority of these, the courses given were not materially different from those of the ordinary high school, except that the classical studies were generally omitted, and commercial branches were taught. They had the advantage of segregating students of common aim and of affording superior facilities for work. The length of the course was ordinarily four years, instead of three, two, or one, as in the commercial course of the ordinary high school. Beyond these, there were no very great advances in them. They were better, but not essentially different from the earlier type. But in a few cities, notably Philadelphia and New York, a different plan was put in operation. There was some attempt to look behind the demand for commercial education, to the real need, and to fill it. It was a problem to be solved, and the school set itself to the task of solving it. If a business career was to be the goal, then all preparation should have that in mind. The whole course of study had to be reconstructed and made to serve an entirely different function from that of the classical high school. Not merely the commercial branches proper, but all the studies in the curriculum, should be adapted to business needs. This was the solution proposed. The development of the plan has been slow, partly because of the need of much experiment, partly because of the dearth of suitable teachers. It was not an easy task to change pedagogical methods to fit the new ideal. Some help was obtained from the study of German and other foreign commercial schools. The experimenting is still going on, and much remains to be done. There has been little outward change in the curricula of these schools recently, but inwardly there has been great development. For instance, in the foreign languages, a fair ability at speaking is regarded as more important than reading. In biology, chemistry, and the like, the commercial importance is demonstrated. Throughout the list, the practical application of knowledge is made and new relations between the studies shown. The whole scheme is becoming a unit, rather than a mixture of conflicting elements. There are only a few high schools of this type in the country now, but two recently established high schools of commerce — that of Boston and that of Cleveland — are based upon this new idea of commercial education. Many of the older ones are gradually tending toward it. It is beginning to be realized by educators that, if vocational instruction is to be given by the public schools, it should be given whole-heartedly, and not in grudging acquiescence to a demand. It should prepare a student not merely to accomplish certain set tasks, but to grapple with new problems.

The five-year course of study of the High School of Commerce of New York City is as follows: —

First Year. — Required: English (4); German, French, or Spanish (4); Algebra (4); Biology (with especial reference to materials of commerce (4); Business Knowledge and Practice[1] (6); Drawing (second half year) (1); Physical Training[1] (2); Music (1); Total, 26 periods.

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[1] Including Local Industries and Government of the City of New York (2); Business Writing (2); Business Arithmetic, Business Forms and Methods (2).

Second Year. — Required: English (3); German, French, or Spanish (4); Plane Geometry (3); Chemistry (with especial reference to materials of commerce) (4); History[2] (with especial reference to economic history and geography) (3); Stenography (3); Drawing and Art Study (2); Physical Training (2); Total, 24 periods.

Electives: German, French, or Spanish (4); Bookkeeping and Business Forms (3); Business Arithmetic (1); Commercial Geography (1).

Third Year. — Required: English (3); German, French, or Spanish (4); Geometry and Algebra[3] (3); Physics (5); History[4] (with especial reference to materials of commerce) (3); Physical Training (2); Drawing and Art Study (1); Total, 21 periods.

Electives: German, French, or Spanish (4); Bookkeeping and Business Arithmetic (3); Stenography and Typewriting (3); Drawing and Art Study (2); Commercial Geography (1).

Fourth Year. — Required: English (3); German, French, or Spanish (4); Economics and Economic Geography (4); History of the United States (with especial reference to industrial and constitutional aspects (4); Physical Training (2); Total, 17 periods.

Electives: A Foreign Language (4); Advanced Chemistry (4); Economic Biology (4); Trigonometry and Solid Geometry (4); Elementary Law and Commercial Law[5] (4); Advanced Bookkeeping, Business Correspondence, and Office Practice (4); Stenography and Typewriting (4); Drawing and Art Study (4); Modern Industrialism (1).

Fifth Year — Required: English (3); Logic, Inductive and Deductive (3); Physical Training (2); Total, 8 periods.

Electives: A Foreign Language (4); Advanced Mathematics (4); Advanced Physics (4); Industrial Chemistry (4); Economic Geography (4); Nineteenth Century History, Europe and Orient, Diplomatic History, United States and Modern Europe (4); Banking and Finance, Transportation and Communication (4); Administrative Law and International Law (4); Accounting and Auditing (4); Business Organization and Management (4); Drawing (4); Advanced Economics (3).

It is too early to obtain more than a glimpse of the results of the new type of commercial secondary school. Undoubtedly it is an advance over the earlier. The instruction given is practical, but it is said that the cultural value of education is by no means lost. It is certain that there is a well-considered and intelligent purpose to meet the real needs of a large body of students for whom the classical high school offers no attractions. Some high schools go so far even as to plan their courses to meet the needs not only of those who will remain until graduation, but also of those who will leave after a year or two. High schools of commerce that are working along these lines report that they have a large proportion of students who would not attend any other school, or would not stay for any length of time. The graduates find it easy to obtain positions in business life. In purely mechanical lines they are not so well prepared as those of the private commercial schools, but in capacity to acquire new knowledge and ability to use it they are far superior. Many of them, indeed, find the first-year work of excellent university schools of commerce almost elementary for them. This is merely because such schools are so few in number that the university schools have not been thoroughly correlated with them. They suffer from the general lack of unity in our education plan, which makes it difficult for the student to gain a coherent, consistent education from beginning to end, other than that which prepares for one of the well-recognized professions; such as law, medicine, teaching, and the like. A similar difficulty under which they labor is the dearth of well-trained teachers. These the university schools are beginning to supply. A beginning has at least been made, and it is not too much to expect that within the next decade the commercial secondary school will have become a very important part of our public school system, with a clearly defined relation to the other parts. More than that, it is probable that vocational schools of other types will have gained a firm footing, as they even now promise to do, under the leadership of the commercial high school. Many cities even now have vocational high schools of several distinct types.

The University School of Commerce. — Commercial education in the universities and colleges has fared somewhat better than the other types, so far as encouragement from above is concerned. But the encouragement has come usually from business men rather than from educators, and has met with only a half-hearted response until the beginning of this century. Educators have not been prompt to take the initiative in the movement. The conservatism that blocked progress in the secondary schools so long, retarded it in the higher schools. This is particularly true in the East. The older universities have been the last to yield to the tendency. Harvard has only recently instituted a School of Commerce under the title of a School of Business Administration. Yale, most conservative of all, has made no move in the direction of commercial education, in spite of the fact that a larger percentage of her academic graduates enter business than any other career, and the percentage is becoming greater all the time. It would seem that the East should be foremost in the commercial education movement, since commerce is there in its most advanced stage, and is more important than in any other part of the country. That it is not, can be due only to a lack of encouragement on the part of educators. For in the West commercial education has developed rapidly, despite the lack of facilities. The state universities have tended toward the practical ideal from the outset, and where schools of agriculture flourished, schools of commerce could not fail to find a ready acceptance. These universities have been less hampered by traditions; they have therefore followed more easily the trend of demand.

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[1] Including Physiology.

[2] First half year, Beginnings of Nations to 1300 A.D. Second half year, Modern History to 1750.

[3] In the second half year, students may elect additional Stenography and Typewriting or Bookkeeping in place of the second course in Mathematics, or may give double time to Mathematics by omitting either Stenography or Bookkeeping.

[4] First half year, English and Colonial History, 1620 to 1750. Second half year, Modern History (England and the Continent), 1750 to present time.

[5] Students who do not elect law in the fourth year may receive instructions in Commercial Law in connection with Advanced Bookkeeping.

The first school of commerce, to be sure, was established in the East. This was the Wharton School of Finance and Commerce, in the University of Pennsylvania, made possible in 1881 by the gift of Mr. Joseph Wharton of Philadelphia. Earlier than this, as early as 1866, in fact, an attempt had been made to establish such a school in the University of Wisconsin. This was by Robert C. Spencer of Milwaukee, who wrote to the Regents of the university pleading for commercial education as a part of the state university scheme. The attempt came to naught, however, and over thirty years passed before the University of Wisconsin entered the field of commercial education. The Wharton School was for nearly twenty years the only higher school of commerce in the country. The founder expressed the desire that the school should offer facilities for obtaining: (1) an adequate education in the principles underlying successful civil government; (2) a training suitable for those who intend to engage in business or to undertake the management of property. At the start the course consisted of only two years and was superimposed upon the first two years of the regular college course. Naturally there was a great deal of experiment necessary before any great degree of efficiency could be reached. In this the school had little assistance: it was forced to work out its problems alone. There were some failures, but on the whole, considering the disadvantages under which the school labored, a remarkable degree of success. In 1895 the course was enlarged to the full four years, although many of the academic subjects were still included. The scope of the work was broadened to include preparation for other lines of business than those mentioned in the statement of Mr. Wharton.

At present the school offers special training for the following vocations: manufacturing industry, banking and finance, brokerage, accounting, transportation and commerce, insurance, social and civil work, the law and the public service, private secretaryship. There is also a general course for students who do not feel able to choose definitely their future vocation by the end of the freshman year. The work of the freshman year is the same for all students, and is as follows: —

Political Economy (2) ; Resources of the United States (3) ; Accounting (3) ; Constitutional Law (3) ; English (3) ; Chemistry[1] (2) ; or Business Law (3).

The work of the school since its inauguration has gradually tended more and more away from the cultural and toward the practical. Courses in journalism and the like have been offered. An evening school has been established, giving instruction to men who are engaged in business during the day. The school has become one of the largest in the university. Recently there were 535 students in the day courses and 284 in the evening school. The degree of Bachelor of Science in Economics is given to students who successfully complete the four-year course. The school has been fortunate in having in its faculty at various times some of the strongest men in the country in the field of commercial education, and its contribution to other schools through them has been hardly less notable than its direct contribution to the business world. Many of its students have been trained for responsible positions in secondary schools of commerce both in this country and in South America.

Until about the beginning of the present century other universities were slow to follow the lead of Pennsylvania. The main reason, perhaps, was that there were few donors so generous as Joseph Wharton to establish schools of commerce. About the year 1900, however, there was a sudden springing up of these schools all over the country. Among the universities to establish them about this time were New York University, Dartmouth College, the University of Chicago, and the state universities of California, Wisconsin, Illinois, Michigan, Vermont, and others. Since that time growth has been rapid. The impetus in the new movement came from several different sources. In some it was the gift of some donor, as in the case of Dartmouth, where the Amos Tuck School was made possible in 1900 by the gift of $300,000 by Mr. Edward Tuck of the class of 1862, as a memorial to his father. This benefaction was later increased. In the case of New York University, the State Society of Certified Public Accountants was largely instrumental in founding the school. In the state universities the schools were established through the regular channels. Within the past few years the movement has had a marked increase in breadth, which testifies to its success. Four new schools were opened at the beginning of the year 1908–1909. Harvard established a school more advanced in type than any of the earlier ones. A gift of $500,000 to Tufts College has made a school of commerce possible there. That the higher schools of commerce in the United States are successful in accomplishing all that was expected of them, and more, seems established beyond the shadow of a doubt.

There are now three main types of higher schools of commerce — that is, of collegiate grade — in the country. These are differentiated by the relative proportion of the liberal, or cultural, element and the practical, or professional, element, and in the relation which these two elements bear to each other. In the first type of school the liberal and the practical elements are given in coördination, and are about evenly balanced. In the second, the liberal element is given or required first, and the practical training is given afterwards. In the third, practical or professional training occupies a dominant position, and the liberal element is reduced to a minimum. The liberal training of the high school is regarded as sufficient for the purpose.

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[1] All students preparing for the manufacturing business are required to take Chemistry in the first year. They may elect Business Law as an extra subject.

The Wharton School, and most of the schools of commerce in the state universities are of the first type. In many cases they are only branches of the colleges of arts, and the practical work is in the nature of applied economics. One of the best organized schools of this type is that at the University of Wisconsin, established in 1900. According to the statement of the authorities, "It was founded in the belief that in order to achieve the largest measure of success at the present time, and in order properly to perform his duties to himself and society, the business man needs not only a college education, but a course of study adapted to his peculiar needs. Justification for this belief was found in the magnitude, complexity, and rapidly changing character of modern industrial processes, and in the unfitness of the traditional college course properly to equip a young man for the most efficient work in this field."

The course of study includes three groups: (1) foundational studies, including natural science, mathematics, English, foreign languages, history, and economics; (2) professional studies, including business correspondence, business forms or documents, accounting, auditing, salesmanship, advertising, credits and collections, business management; (3) elective studies. In 1909–1910 the school had 237 students, of whom 95 were freshmen. In most of the schools of this type, the tendency has been to decrease the cultural element, and to increase the professional. This is seen particularly in the oldest school of the kind, the Wharton School.

Of the second type, the Amos Tuck School of Administration and Finance at Dartmouth College is the best example. It is a graduate professional school, following the four years of college work, but is so adjusted to it that the first year of the school, requiring for admission three years of college work, is equivalent to the college senior year, while the second year of the school constitutes a fifth year strictly graduate in character. The Tuck School confers the degree of Master of Commercial Science upon regular students who have completed the work of both years. Of these two years, the first lays emphasis on the practical aspects of business activity; the second includes strictly technical work and is more specialized.

The general business course includes the following subjects: —

First Year. — First Semester: Accounting (2); French, German or Spanish (2); National Industrial Efficiency (2); Economic Geography (4); Statistics, (2); Money and Banking (3); Industrial Organization (3); Total, 18 hours.

Second Semester: Accounting (2); French, German or Spanish (2); Theory of Business Administration (2); Resources and Industries of the United States (4); Statistics (2); Commercial History and Policy (3); Transportation (3); Total, 18 hours.

Second Year. — First Semester: Accounting (2); French, German or Spanish (2); Commercial Law (2); Corporation Finance (2); Business Management (2); Practical Banking (2); Thesis (2); Total, 14 hours.

Second Semester: Accounting (2); French, German or Spanish (2); Commercial Law (2); Corporation Finance (2); Thesis (6); Total, 14 hours.

Special courses are also given in preparation for particular vocations; namely, foreign commerce, banking, transportation, insurance, and accounting. In these the work for the first year differs only slightly from that of the general business course, but in the second year there is a wider departure. Accounting, commercial law, corporation finance, and a foreign language are retained in all, however. Opportunity is afforded for a great deal of individual investigation of a practical character. The plan of the school is in close accord with that of the schools of law, medicine, etc., of the universities, and seems theoretically sound. The school, however, has grown but slowly, and to the close of the academic year 1910 had graduated only 56 students. From this it might appear that its type was too advanced for present-day demands.

Harvard's School of Business Administration is of the same type, however, and is, if anything, more advanced. A full college course is required for entrance. The degree of Master of Business Administration is offered to students completing the two-year course. Harvard's location is less disadvantageous for the purpose than that of the Amos Tuck School, and in the short period of its existence it has shown promise of usefulness. The severity of the entrance requirement is against rapid development, and because of it a large proportion of the students thus far have been specials. Many are active business men who come in from Boston and the vicinity to take one or two courses. The experiment of placing business on the level with law and other learned professions is too new to have received a thorough test, but it is at least being tried under the most favorable conditions.

Of the third type of school of commerce, that of New York University is the best example. It is a professional school, but, unlike those of the second type, is not distinctly a graduate school. Many college graduates do enter it, but the only real requirement is a four-year high school course or the equivalent. Sessions are held in the afternoon and evening only, in order that instructors and students may both be drawn from those who are actively engaged in business during the day. The degree of Bachelor of Commercial Science is conferred upon students who meet either of the following requirements : (1) If they obtain satisfactory credit for 900 single hours of evening work, being 10 hours per week for three university years of 30 weeks each, and in addition satisfy the faculty that they have had at least two years' successful experience in business. (2) If they obtain satisfactory credit for 600 single hours of evening and 600 single hours of afternoon work, being in all 20 hours per week for two university years of 30 weeks each. When founded in 1900 the school was intended mainly to provide a scientific preparation for public accountancy. The scope has been broadened constantly since that time, until now preparation is given for all the business professions, including mercantile and manufacturing business, banking, brokerage, insurance, real estate, advertising. Preparation is also given for journalism and for the teaching of commercial subjects. The work is all of practical rather than cultural character, and is mainly elective. Certain requirements, however, must be met by each candidate for a degree. He must have passed successfully at least 120 hours in each of the four main groups of studies; namely, accounts, commerce, finance, and law. Some of these courses are prescribed. In fact, the work taken the first year by most of the regular three-year evening students is the same. It includes accounting, corporation finance, political economy, commercial law, and business organization. Later there is more specialization. The experiment of offering courses of university grade in the evenings did not at first meet with the approval of educators. Experience has demonstrated, however, that successful work can be accomplished under this plan, and that it has certain great advantages in commercial education. It has enabled the school to meet the needs of a large body of men in New York City and to offer them a higher grade of instruction than could be afforded in any other way. The quality of work done by them is apparently up to the standard of the best schools of commerce in the country. The growth of the school has demonstrated its fitness to conditions. From 60 students in 1900–1901 it has grown until in 1910–1911 there were over 1100, a greater number than were enrolled in any other university school of commerce in the country. Of these about half were part-time students. Of the regular students in 1910–1911, 113 were college graduates and 67 came from foreign countries.

The success of the experiment in the New York University has led to the foundation of similar schools elsewhere. The University of Pennsylvania introduced an evening school of the same type. Others have been started at Northwestern University and University of Denver, and there are indications of similar movements elsewhere. This type of school would almost necessarily be situated in or near a large city, and in such a situation it seems to be the type most urgently demanded. All three types have been successful enough to lead to the belief that they are rendering a distinct service and a service that will constantly increase in the future.

In addition to the schools already mentioned, there are others giving commercial education of various grades. Several privately endowed institutions, such as the Drexel Institute (*q.v.*) in Philadelphia, give instruction that is more liberal and more advanced than that of the ordinary private commercial school, but is hardly of university grade. Many schools give courses by correspondence, and some of these have reached a high plane of usefulness.

From the foregoing discussion it may be seen that almost every conceivable grade and kind of commercial education is now given in the United States. Indeed, it is doubtful if any other country can offer so wide a range. The chief weakness is that there is no coherent system by which a student may prepare consistently for a business career throughout his education. The next step in advance will be to coördinate the various elements and bring them into closer relation with each other. When this is done the United States will have a system of commercial education second to none in the world.

Germany. — The supremacy of Germany in commercial education is as generally conceded as her high place in commerce itself. Which was the cause of the latter is a matter of some dispute, but there is no doubt that each assisted the other to a marked degree. Her growth and development in the two fields has been rapid and simultaneous since the latter part of the nineteenth century, especially since 1887, which marked the beginning of Germany's real advance in commercial education. The result has been manifested in the most complete and comprehensive scheme of commercial education in the world. Its salient features are the close relation of its several parts and its breadth of outlook. The system in Germany's education has long been the envy of foreigners. The whole structure is admirably planned to give a unified and thorough preparation for any calling in life. It is fostered and controlled by the government, and thus secures not only provision for all classes of students, but also a harmonious interrelation of the several schools. The *Realschulen* and *Oberrealschulen* are credited with the foundation of the scheme of commercial education, because they have been kept constantly in touch with changing needs, and have therefore supplied preparation that is not too rigidly classical in character. The strictly commercial education, however, is given mainly by three types of schools, corresponding roughly to the three main types in the United States; namely, the private commercial school, the public secondary school, and the university. In Germany the three main groups are the continuation school, or school for apprentices, the middle commercial school, and the higher commercial school.

The continuation schools (*Fortbildungsschulen*) (*q.v.*) are found in almost every city or town of importance in the German empire, to the number of over 650. Their province is to give apprentices who have left school at about the age of fourteen an opportunity, while learning their trades, to acquire theoretical knowledge which will be useful to them and enable them to rise in the scale of their work. Sessions are held in the morning, from 7 to 9, or in the afternoon, and the instruction is generally about 10 hours a week for each student. The subjects taught include German, English, French, and sometimes other modern languages, commercial arithmetic, study of commerce, bookkeeping and correspondence, geography and penmanship. Attendance at these schools is in the majority of cases compulsory, and extends over a period averaging about three years. The employer is held responsible for the attendance of his apprentices, and for the tuition, wherever a fee is charged. Most of the schools are supported, however, by the city authorities or by the chambers of commerce. In some cases they are supported by the body of those benefited by them. One at Hamburg, for instance, is wholly paid for by the *Verein für Handlungskommis* (Society for commercial clerks). At this school Danish, Russian, Portuguese, and Spanish are taught, as well as the languages mentioned above. Some of the schools are connected with the middle schools of commerce, and others are independent. The middle school of commerce corresponds to our commercial secondary school. Students are taken at about the age of fourteen or fifteen, and usually remain three years. They receive a completion of their general education, and also technical knowledge that will be useful in the business professions. Those who have completed a general high school course already may take a short course in technical subjects. Those who receive the diploma and complete their terms of apprenticeship are eligible for admission in the higher schools of commerce. These middle schools are probably no better than the best high schools of commerce in the United States, but they are of more uniformly high level. They number more than 200. The quality of instruction is particularly good, as every teacher has had special training and nearly all of them are men. They differ in plan of organization and in manner of support. That at Leipzig, which is typical, is supported partly by students' fees, partly by income from endowment, and partly by the government. Any deficit is met by private subscription.

Higher schools of commerce in Germany are of recent growth, as recent indeed as those in the United States. The first movement was made in 1879, headed by Gustav von Mevissen; but it did not result in anything definite for some years. The first higher school of commerce was not established until 1898. This was at Leipzig, and came as a result of the second Congress of Commercial Education held there in June, 1897. Responsibility for the school was assumed by the Leipzig Chamber of Commerce, with the support of the Saxon government. The degree of coöperation involved in the enterprise is indicated by the classes of men represented in the senate which controls the school. There is one member of the Saxon government, one of the municipality of Leipzig, the president and two other members of the Chamber of Commerce, three professors of the University of Leipzig, two teachers of the Middle Commercial School, and a director of studies. The purposes of the Leipzig school were stated as follows: (1) To give to young men who already possess a certain degree of mental maturity a wide and thorough general and commercial education. (2) To give to professors and teachers already instructing in commercial schools, an opportunity to perfect themselves theoretically and practically in any particular branch. The school was a success from the start, and at the end of the first five years of its existence had over 500 students, of whom nearly one half were foreigners. Among subjects taught are theoretical and practical political economy, including coinage, weights, measures, banking and stock exchange business, commercial politics, commercial statistics, credits, transportation and insurance, the science of finances, including taxation, public credit and customs duties, knowledge of substance of goods and technology, commercial geography, economic history, general law knowledge, commercial law, law of exchange and maritime law, bankruptcy, international law, colonial policy, eight modern languages in advanced stages, etc. From this it may be seen how broad and comprehensive the plan of the work is. It is particularly notable that there is a tendency to regard commerce as not merely an internal matter, but a matter of world-wide scope. The outlook here, and in fact in all German commercial education, is far broader than in that of any other country. The significance of this fact in relation to the extension of Germany's commerce can hardly be overestimated. The School at Leipzig was at first conducted in the building of the Middle School, but in 1902 it obtained a home of its own. In the meantime similar schools had been founded in Cologne in 1900, and in Frankfort in 1901. Others soon followed, the most important of which is at Berlin. They differ in minor particulars, but in general their aims are similar. The school at Cologne has a more definite plan than some of the others, and has had the largest attendance. The diploma requires two years' study. A great deal of specialization is allowed at these higher schools, and the student is encouraged to think for himself. A frequent criticism of German education has been that it did not do enough of this; its system made the work too mechanical and disciplinary, and did not leave sufficient room for the development of the individual. This may be a just criticism of the system as a whole, but it seems not to be true of the higher schools of commerce.

As a whole, Germany's commercial education seems to have reached a remarkable degree of perfection, and is sufficient answer to those who claim that commercial schools are lowering the ideals of education. For Germany has maintained her position in other fields of education without difficulty, in spite of her advancement here. The classical and scientific have not suffered because of the commercial. And Germany's progress in the field of commerce, especially in that with foreign countries, has received great stimulus and help from it.

Other Countries. -- Imperfect as are the systems of commercial education in Germany and the United States, those of other countries are even less advanced. England is far behind, a fact which has caused no little uneasiness among English business men. The chief hindrance to progress is the examination method which has been in vogue there so long, and which naturally has given little incentive to improvement of instruction. Examinations in commercial subjects are conducted by the London Chamber of Commerce, the Society of Arts, the Institute of Chartered Accountants, the Institute of Bankers, and many other bodies, each for its own aims and in its own way. There was little coöperation between the bodies, although this defect is being remedied. But because of this unfortunate system, schools have been devoted too much to cramming, and development has been individual and slow. Up to the beginning of the present century there was little commercial education worthy of the name. Even now, although there are almost innumerable varieties of commercial schools, few are comparable with similar ones in Germany and the United States. Continuation schools have been established and recognized by the Department of Education. They give evening instruction of a rather elementary kind in commercial subjects. There are a number of private business schools, notably the Pitman School, similar to those in the United States and equal to the best of them. Secondary schools of commerce have been established in a few large cities, through the efforts of the chambers of commerce and other commercial bodies. The London School of Economics and Political Science, founded in 1895 and supported at first by the Technical Education Board of the London County Council, gave higher commercial instruction of a rather liberal character. In 1900 it was admitted into the University of London. Courses covering a wide range are given, and the degrees of Bachelor of Science and Doctor of Science are conferred upon successful candidates. Other university and college schools of commerce, most of them of a more professional character than that at London, have been established in Liverpool, Manchester, Leeds, Birmingham, and other cities. The evening courses have met with a fair degree of success. There is still a great lack of organization in the various types of schools, and indeed the types are by no means well-defined.

France has a few old and well-established schools of commerce, but on the whole the number of students in commercial education is surprisingly small, and the system is not very extensive. There are continuation schools with evening sessions under government supervision, in which instruction is given in commercial and industrial subjects. Private commercial schools like those in the United States are also found in many cities. The chambers of commerce are responsible for three other types of commercial education: (1) Free evening classes; (2) secondary commercial schools; (3) higher commercial schools. Of the third type, the School of Higher Commercial Studies at Paris is the most advanced. It presumes a fair degree of maturity in the students, and the number of these is limited. A two-year course is given of about the grade of university schools of commerce in the United States. Emphasis is laid upon instruction in languages, accounts, commercial geography, commerce, and commercial law. There are more than a dozen other higher schools of commerce in France. Some are among the oldest in the world, but they are not considered to be on a par with Germany's. It is said that government supervision has retarded instead of assisting them. Many of the schools in France, notably that at Lyons, and some in other countries, as at Antwerp, give technical, or productive, instruction together with the commercial.

Austria and Belgium have practical and thorough systems of commercial education. Belgium is credited with having established the first commercial school of true university grade at Antwerp in 1853, and the work has been kept up to date. Switzerland has an excellent high school of commerce. Other countries all over the world are active in establishing schools of commerce, and even South American countries have felt the force of the movement, which promises to become worldwide.

J. F. J.

See articles on the separate national systems.

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COMMERCIAL SCHOOLS. — See COMMERCIAL EDUCATION.

COMMISSIONER OF EDUCATION. — A term practically synonymous with Superintendent of Schools; Superintendent of Education; Superintendent of Public Instruction; or Superintendent of Common Schools. It is used to designate the head of an executive department of education in a state, or in the nation; as, for example, the United States Commissioner of Education (*q.v.*); the Commissioner of Education for the State of New York; the Commissioner of Education for the State of Massachusetts; or the County School Commissioners of the State of Georgia.

COMMISSIONS, EDUCATIONAL, RECENT AMERICAN. — As applied to education the word " commission " has recently come into frequent use as a generic term to designate certain special boards or committees constituted for the purpose of making investigations and reports upon particular issues of moment, or of administering special educational activities. Indeed, from a survey of current educational terminology it might be concluded that this word has been substituted for the former term, " committee." Owing to the wide difference in origin, purpose, and character of these recent commissions, it is difficult to classify them satisfactorily. From the several points of view, however, they may be grouped as follows: as to scope of operation — international, national, state, or local; as to function — administrative, or investigative and advisory; as to duration — permanent or temporary; or as to status — legal or extra-legal; and as to personnel — lay or expert.

State Commissions. — The administrative or supervisory commissions usually form a part of the permanent statutory state system of school government, and are created to direct or develop some particular activity or division of the educational organization. This type is well represented in the state and county textbook commissions existing in many states for the purpose of selecting and adopting uniform textbooks (*q.v.*) for elementary and secondary schools. They are generally composed, in part, of certain state and local educational officers, *ex officiis,* and, in part, of appointed representatives of the several different classes of public schools. The trend of current legislation is for the organization of special commissions for this purpose. Within this group belongs also such administrative boards as the Commission on Industrial Education, created by the legislature of Massachusetts in 1906 for the purpose of establishing and supervising independent industrial schools. This commission was consolidated with the State Board of Education in 1909. The predecessor of this last-named commission was the Commission on Industrial and Technical Education, a temporary organization created by legislative action in 1905, and composed of nine representatives of manufacturing, agricultural, educational, and labor interests to " investigate the needs for education in the different grades of skill in the various industries of the commonwealth." The investigations and report of this commission resulted in the establishment of the whilom permanent commission. The School House Commission created by the Utah legislature in 1909 for the approval of plans of school buildings may likewise be placed in this group.

The most important of state commissions, and the type of organization to which the term " educational commission " has been most appropriately applied in recent years, are the special bodies instituted recently for the express purpose of revising the general body of laws pertaining to the public school system, or of making special investigations, and presenting recommendations concerning needed legislation. Commissions of this sort have existed recently in Arkansas (1910), Delaware (1909), Colorado (1910), Connecticut (1903 — industrial education, and 1907), Kansas (1907), Idaho (1909), Illinois (1907), Indiana (1907), Iowa (1907), Kentucky (1908), Maine (1909 — industrial education), Maryland (1908 — industrial education), Michigan (1909 — industrial education), New Jersey (1907 — industrial education), North Dakota (1909), Ohio (1907 — school revenue), Pennsylvania (1907), South

Carolina (1910), Tennessee (1907), Vermont (1906 — permanent school fund), Virginia (1908, 1910), West Virginia (1906), Washington (1907), and Wisconsin (1910 — industrial). Excepting those in Arkansas, Colorado, Kansas, Indiana, and Ohio, these commissions were created by the authority of the state legislatures. The Connecticut and Tennessee commissions were created from joint legislative committees. The others were constituted in various ways, the tendency being to appoint professional representatives. The Kansas commission of 1908 was appointed by the governor of the state at the instance of the state teachers' association "to investigate carefully present educational conditions and to recommend such legislation as in its judgment is most needed." The Indiana commission of 1906 originated and was appointed in a similar way, "to investigate the question of school taxation and teachers' salaries, and all other educational questions which may rightfully come before such a body." The Ohio commission of 1907 was an independent organization representing the state teachers' association. Each of these three commissions made a special report. The commissions in Arkansas, Colorado, Illinois, Iowa, Kentucky, Tennessee, Pennsylvania, South Carolina, West Virginia, and Washington were instituted for the primary purpose of revising and simplifying the laws governing the educational organization. The spirit of this movement for the better adaptation of the educational organization to modern needs is well indicated by the duties assigned to the Illinois commission, "to make a thorough investigation of the common school system of Illinois, and the laws under which it is organized and operated; to make a comparative study of such other school systems as may seem advisable, and to submit to the forty-sixth general assembly a report including such suggestions, recommendations, revisions, additions, corrections, and amendments as the commission shall deem necessary." In a number of instances the investigations and recommendations of the commissions have formed the basis of a considerable body of constructive legislation. Among the conspicuous exceptions during 1909, however, were Iowa, Illinois, and Pennsylvania, in which states the legislature failed to consider favorably the major recommendations of the commissions.

Local Commissions. — The following local commissions are enumerated as typical of different contemporary educational movements: (1) Boston Board of School House Commissioners, created by the legislature in 1901 for the purpose of controlling and administering public school buildings and grounds of that city; (2) Chicago Educational Commission (*q.v.*), authorized by the city council, December, 1897, and appointed by the mayor, January, 1898, for the purpose of investigating and recommending changes in the organization of the public school system: (the report of this commission is the most comprehensive analysis of municipal school organization yet made;) (3) Cleveland Educational Commission: a citizens' committee, appointed by the Board of Education in 1905, "to examine carefully the government, supervision, and course of study of the Cleveland public schools." (4) New York Teachers' Salary Commission, appointed by the mayor in 1909 to report regarding the equalization of the salaries of men and women teachers in public schools; (5) Pittsburg Teachers' Salary Commission, created by the Central Board of Education in 1904 for the purpose of regulating promotion and compensation of teachers in the public elementary school. This commission, composed of representatives of the supervisory and teaching force, was declared illegal in 1908 (see *Houston* v. *Central Board of Education of Pittsburg* 68 A, 1036); (6) Washington School House Commission, created by Congress in 1906 (Public Act No. 254, Fifty-ninth Congress, first session) for the purpose of submitting a general plan for the consolidation of the public schools of the District of Columbia and a general plan for the character, size, and location of school buildings.

Associational Commissions. — A number of educational associations and other extra-legal organizations have, in recent years, appointed special investigative committees. The following examples of these committees, to which the term "commission" has been attached, may be regarded as typical: (1) National Commission on the Teaching of Physics (1907), composed of representatives of 14 associations for the study of the problems of the teaching of physics; (2) Commission on College Entrance Requirements in Latin (1908), composed of 15 representatives of classical associations, colleges, and secondary schools to formulate definitions of such requirements; (3) International Commission on the Teaching of Mathematics, formed at the Fourth International Congress of Mathematics, Rome, 1908, for the investigation of the teaching of mathematics (4) Commission on Accredited Schools and Colleges, established by the North Central Association of Colleges and Secondary Schools in 1901 and composed of representatives of both classes of institutions. Its purpose is to bring about reasonable uniformity in the requirements for admission to college.

National Commissions. — Education in the United States is so much a state affair that, aside from independent professional organizations having a national scope, commissions created by Federal sanction and dealing directly with educational matters would be regarded as unnecessary and inexpedient. Nevertheless, certain of the recent Federal commissions have investigated and reported upon issues that can but be classified as educational. Of these may be specifically mentioned the Immigration Commission (1907 — report 1911), the

Country Life Commission (1908), and the National Conservation Commission (1909 — chapter on National Vitality).

International Commissions. — While not a part of the American educational structure, the recent inspection of and reports upon American schools by official and unofficial commissions representing foreign nations have not been without their influence. The Mosely Educational Commission (*q.v.*) from England in 1903 and the Royal Prussian Industrial Commission in 1904 are probably the more prominent of these commissions.

Broadly speaking, the educational commission is representative of an endeavor to democratize and to unify the organization of education through intelligent and widespread coöperation; and to base the organization of the public school system upon the results of thorough and intensive investigations of the conditions and factors influencing educational efficiency. E. C. E.

For English commissions see PARLIAMENTARY EDUCATIONAL COMMISSIONS.

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COMMISSIONERS, BOARDS OF SCHOOL. — A term practically synonymous with Boards of Education, when used for the managing board of a city school system, as, for example, the Board of School Commissioners for the city of Baltimore, or the city of Indianapolis.

See CITY BOARDS OF EDUCATION, and the special articles on the cities mentioned.

COMMISSURE. — See NERVOUS SYSTEM.

COMMITTEE OF SEVEN, OF EIGHT, OF FIVE. — Committees appointed by the American Historical Association, which reported on the study of history in schools in 1899, 1909, and 1911 respectively.

See HISTORY; COLLEGE REQUIREMENTS FOR ADMISSION.

COMMITTEE OF FIFTEEN, THE. — In 1893 the National Educational Association appointed a committee of fifteen members, under the chairmanship of Superintendent William H. Maxwell of New York City, to investigate three principal topics connected with elementary education, viz. The organization of a school system; the coördination of studies; and the training of teachers. The committee divided itself into three subcommittees, and prepared lists of questions designed to draw out expert opinions. On the various topics presented a series of conferences followed, and the conclusions of the committee were formulated. In general, it may be said that the recommendations regarding the organization of city school systems have constituted the basis for considerable reform in this field. The subject of the coördination of studies was complicated, and the recommendations in this field have had relatively little effect. D. S.

COMMITTEE OF TEN, THE. — The committee (of ten) on secondary school studies was appointed by the National Educational Association on July 9, 1892, under the chairmanship of President Charles W. Eliot of Harvard University. The general object in the appointment of the committee was to secure desirable uniformity in school programs, and in requirements for admission to college. The committee was directed to provide for conferences (nine in number), on the principal subjects which enter into high school curricula, and, on the basis of their reports, to prepare a general report, with recommendations. This is commonly known as the *Report of the Committee of Ten.* A series of questions bearing on the organization and conduct of the subjects of the curriculum were made the basis of the special reports, in addition to which, two questions bearing on educational advantages were submitted to the conferences. Of these, the inquiry as to whether a subject should be treated differently for students going to college, and for those making a high school education their last training, excited the widest discussion.

The report was one of the most celebrated ever made in the country, and, for a number of years, constituted a point of departure in the organization of high school curricula. Its effect was to supersede, in many secondary schools, a program of short and miscellaneous courses by a program of relatively few subjects, carried for four or five hours per week, and for at least a half year. It caused colleges to translate their admission requirements in terms of units of the work thus offered. It undoubtedly led to considerable uniformity in secondary curricula throughout the country and in college admission requirements. Other recommendations involved, such as the correlation of certain subjects and a Saturday half session for science, have not been realized in practice.

The report raised the question of educational values in an important way. While directing attention to the fact that the college receives but a small proportion of the pupils of the secondary schools, the report lays stress on the idea that teaching should not be varied according as the pupil is to enter college or not. That was emphasized on the ground that the educational value of one subject was the equivalent of that of another, provided each were taught with equal seriousness and for a sufficient length of time. This theory of the equivalence of educational values, which to a large extent seems to rest on the doctrine of formal discipline, provoked extensive discussion and disagreement. There is yet by no means unanimity of opinion as to the propositions laid down in the report.

The reports of the conferences have constituted valuable bases for the discussion of method, but in this field, the progress has been such as to render subsequent revision necessary.

D. S.

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COMMITTEE OF THE NATIONAL EDUCATION ASSOCIATION ON TEACHERS' SALARIES, TENURE, AND PENSIONS. — See Teachers' Pensions; Teachers' Salaries; Teachers' Tenure.

COMMITTEE OF TWELVE ON MODERN LANGUAGES. — See Modern Languages, Teaching of.

COMMITTEE, SCHOOL. — A term commonly used in the New England states for what is called elsewhere a Board of School Trustees or Board of Education. The term has a historical significance in New England, as is explained at the beginning of the article on City School Administration (*q.v.*).

COMMODIANUS. — Church Father and poet, born at Gaza in Syria about A.D. 200, of heathen parents, and educated in pagan schools. By the reading of the Bible he was led into Christianity, of which he became a teacher and ultimately a bishop in the North African Church. He was one of the earliest of the Latin poets of the Church, constructing his verses with reference to accent rather than quantity. His style lacks the elegance of classical Latin and the technical precision of the Greek theologians, but his writings are marked by deep practical piety. Like the Western theologians, he prefers to deal with man and his needs rather then to speculate about God, as do the Orientals, and he has no use for Greek philosophy. But two of his works are still extant. His *Instructiones* consist of 80 acrostics of an apologetic, polemical, and parenetical character, written about 338. His *Carmen Apologeticum* against Jews and Gentiles was written in 249, and consists of 1043 verses discussing the doctrine of God, Man, and the Saviour. The best edition of these is that of Ludwig, Leipzig, 1878. The *Instructiones* are translated in the *Ante-Nicene Fathers*, Vol. IV. They are somewhat crabbed in style, but form an interesting example of early Christian poetry, and illustrate the attitude of the Latin Fathers toward Greek culture and philosophy, which culminated in the violent hostility of Tertullian and Augustine toward all pagan learning.

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COMMON LAW IN ENGLISH EDUCATION. — The universality of church control (see Church Schools) over national education was undoubted until after the Black Death (1349) (see Black Death and Education), but after that date, and indeed a little before, we see coming into existence a new attitude of the State toward education. In 1346, in the *Ferendon Grammar Schools Case*, the Crown declared that all pleas relating to the patronage of grammar schools belong to the crown courts and are not to be heard in the spiritual courts (*Registrum Brevium*, fol. 35). That is the first we hear of the common law in relation to education. In 1391 the Crown refused to grant a petition that no unfree child should be allowed to attend school (3 *Rot. Parl.* p. 294, 15 Ric. II, 39). In 1393 there appears a petition from the Archbishop of Canterbury, the Bishop of London, the Dean of the Free Chapel of St. Martin-le-Grand, and the Chancellor of the Church of St. Paul's, London, alleging their complete control over grammar teaching in London, stating that unlicensed masters were nevertheless holding general schools, and further that they had consequently proceeded against these masters in the spiritual court and that these masters had thereupon gone to the secular court asking that they might hold their schools without the consent of the Archbishop, Bishop, Dean, and Chancellor. The petition went on to ask that the Privy Council should restrain the secular court from interference, and that the matter might be settled in the spiritual court according to law and custom (3 *Rot. Parl.*, 324). How strong the secular court had become may be judged from the fact that the King never answered the petition from these important personages. The next stage was the passing of the important act of 1406, which declared " that every man and woman of what state or condition that he be, shall be free to set their son or daughter to take learning at any school that pleaseth them within the realm." (7 Hen. IV, c. 17. See also 3 *Rot. Parl.*, p. 602.) From this time forward the common law maintained the right of every child to education, though that right did not impose a duty on the parent to give his child education. The case of *Hodges* v. *Hodges* decided in 1796 (Peake's *Reports*, Vol. II, p. 79) that no legal duty attached to parents in this matter, and this duty was not in fact imposed until the passing of the Education Act, 1876, 470 years after the first statute of education.

The next question with which the common law had to deal was the right of teachers to teach, and this was considered and decided in the famous *Gloucester Grammar School Case* in 1410. (See *State Intervention in English Education*, pp. 50-60.) This case decided that by the common law of England no person with the necessary intellectual qualifications could be restrained from teaching school where he pleased. The case (the report of which is in the *Year Book*, 11, Hen. IV — the text is reproduced in *State Intervention in English Education*, pp. 241-242) is one of the most important early documents in the history of English education. It was an action of trespass brought by two masters of the Gloucester Grammar School against the master of another school in the town claiming damages for the infringement of their alleged monopoly. The case was decided on two grounds: first that no cause of action was shown, and secondly that the action, if triable at all, could only be tried in the spiritual courts. On the first point Mr. Justice Hill said: " There is a fundamental failure in this case to maintain action inasmuch as the plaintiffs have no estate but merely an uncertain ministry like any other person who, being as well qualified as the plaintiffs are, comes to teach youth. It is a virtuous and charitable thing to do, helpful to the people, for which he cannot be punished by our law." A more explicit statement of the common law can hardly be imagined. As to the second point no doubt in the year 1410 the education and teaching of children was, as it is by many still, regarded as " a spiritual thing," but it is to be noticed that the Chief Justice does not base his judgment on the general ground that educational questions were only cognizable by the ecclesiastical courts; the claim is formally founded on the appointment of the plaintiffs by local ecclesiastical authority and must stand or fall by the right of that authority according to ecclesiastical law to make that appointment; therefore *il semble que cest action ne puit estre trie en cest Court.* But the principal grounds for the decision are those given by Mr. Justice Hill and Mr. Justice Hankeford. "To teach youth . . . is a virtuous and charitable thing to do, helpful to the people, for which he cannot be punished by our law "; " it would be contrary to reason that a master could be disturbed from holding school where he pleased." It has been necessary to consider the question at length, as it is impossible to understand subsequent educational developments in the sixteenth, seventeenth, and eighteenth centuries without clearly appreciating the enunciation of the common law of education. This will be best understood by reference to another important law case, that of *Matthews* v. *Burdett*, which was argued on the Queen's Bench in 1702. In that case Dr. Lake, a civilian, argued with great force that schoolmasters were not under the control of the Church. He alleged that a schoolmaster was originally a layman and under the control of the civil magistrate. He is here referring to the schoolmasters in Roman times, who were undoubtedly appointed by the local authorities under the Edict of Gratian of the year 376. He went on to say "that the common law takes no notice of it" (the schoolmastership) " but as temporal," and takes as his authorities the *Ferendon Grammar Schools Case of* 1346 and the *Gloucester Grammar School Case* of 1410. He (wrongly) alleges that there was no common law requiring a license till the Third Council of Lateran (1215). He then goes on to argue with force that " the several Acts of Parliament which require the school-master's taking a license from the Bishop, shew it was not necessary before, nor was there any great Usage or Practice that can be made appear. Vide 23 Eliz., c. 2; 1 Jac. I, c. 4; 14 Car. II, c. 4." Cowper. the counsel on the other side, quoted

Lyndwood, the statute *de comburendo heretico* (7 Hen. IV, c. 15) and immemorial usage as the authorities for church control. No decision was ever given in this case, but it is to be noted that Cowper did not meet Lake's plea of the common law. We shall see directly that by this date the common law had become fully operative. But first a word as to the question of church control and the common law after the Reformation. There is no legislation as to the church control of schoolmasters until the year 1581, when by 23 Eliz. c. i., secs. 6, 7, it was enacted that " if any person or persons, Body Politick or Corporate, after the Feast of Pentecost next coming, shall keep or maintain any schoolmaster which shall not repair to church as is aforesaid, or be allowed by the Bishop or Ordinary of the Diocese where such schoolmaster shall be so kept, shall forfeit and lose for every month so keeping him, ten pounds," and " provided that no such Ordinary or their Ministers shall take any thing for the said allowance; such schoolmasters or teachers, presuming to teach contrary to this Act, and being thereof lawfully convicted, shall be disabled to be a Teacher of Youth, and shall suffer Imprisonment without Bail or Mainprise for one year." Thus the statute law ousted the ecclesiastical jurisdiction, though this point was questioned later. It would be difficult to find an ecclesiastical prosecution for teaching without a license in the sixteenth century before this act. But under the statute prosecutions began. Thus on May 1, 1584, a jury at the Middlesex Sessions found a " True Bill that William Smithers *alias* Smithurse of the parish of St. Bottoles in the liberty of the Charterhouse near London, from the said day to first of July next following docuit, Anglice kepte 'a common scole in *Capell*' de Charterhouse predict without the license of the Bishop or Ordinary of the Diocese " (*Middlesex Sessions' Rolls*, Vol. I, p. 149). Here the State is taking up by statute the part played by the Church in the fourteenth century. The necessary inference is that the common law was too strong for the Church. But the act of 1581 evidently failed to check the unlicensed teaching that was protected by the common law, for in 1604 (1 Jac. I, c. 4, sec. 9) the law was greatly strengthened. The section provided " that no person after the Feast of St. Michael the Archangel next shall keep any school, or be a school-master, out of any of the universities or colleges of this Realm, except it be in some public or free grammar school, or in some such nobleman's or noble-woman's or Gentleman's or Gentlewoman's House as are not Recusants, or when the same Schoolmaster shall be specially licensed thereunto by the Archbishop, Bishop or Guardian of the spiritualities of that Diocese; upon pain that as well the school-master, as also the party that shall retain or maintain any such school-master contrary to the true intent and meaning of this Act, shall forfeit each of them for every day so willingly offending, forty shillings." The Act of Uniformity of 1662 made the statute law still more stringent. The spiritual control of schoolmasters was tightened to the breaking point. Section 6 ordered every schoolmaster and tutor to conform to the liturgy, and Section 7 provided that schoolmasters teaching in private houses without license should suffer three months' imprisonment for the first offense and the same term with a fine of five pounds for the second and third offense. These statutes operated side by side with stringent episcopal articles in various dioceses as to licenses, and with Canon LXXVIII of 1604, which had made the episcopal license necessary for all teachers. The Five Mile Act of 1665 forbade all Dissenters to teach at all, while Archbishop Sheldon set up in his province an inquisition into the faith of all teachers public or private. The position had become intolerable, and the question arose whether the common law of education could assist the common people. The first stage of the new movement was the usual English stage. Juries refused to convict. Thus on Mar. 27, 1674, a true bill was returned against a schoolmistress, Frances Bedingfield, for teaching without a license. On Apr. 27, Frances put herself upon a jury of the country, and on July 15, 1674, the jurors declared her "not guilty." Again in January, 1683–4, at Finchley in Middlesex, Austin Swift, schoolmaster, did the same thing and the jury found him "not guilty." That was the inconvenience of a trial by a common law court. Consequently the ecclesiastical courts reopened their doors, with the result that the common law courts of Westminster secured their opportunity and brought the weapon of prohibition into play. These courts found divers ways to evade the statute law and give the common law free play. In 1670, in *William Bate's Case* (Ventris' *Reports*, Vol. I, p. 41) the King's Bench granted a prohibition to the Commissarý of the Archdeacon of Richmond, who had endeavored to eject Bates for teaching without a license. The court held that as Bates had been presented by the founders of the school, the ecclesiastical court could only *censure* him. In the case of *Chedwick* v. *Hughes* in 1699 (Carthew's *Reports*, p. 664) it was held that when there was a civil remedy (under 1 Jac. I, c. 4, s. q.) a suit in the ecclesiastical courts would not lie. Here we have a second limitation on the courts spiritual; and yet if the authorities applied for a civil remedy juries would not convict. But the courts were prepared to go much farther than this. In *Cox's Case* (Peere William's *Reports*, Vol. I, p. 29), decided in the year 1700, it was held that the old ecclesiastical jurisdiction only applied to grammar schools, and that it did not and never had applied to elementary schools, such as reading and writing schools. A prohibition therefore issued quashing proceedings against Cox in the spiritual court at Exeter. This principle was carried a step farther in 1701, when in the case of *Rex*

v. *Douse* (Lord Raymond's *Reports*, Vol. I, p. 672) Douse having been indicted under 1 Jac. I, c. 4, for having kept school without the bishop's license, it was held that the indictment was bad, as the act of James I only applied to grammar schools. Thus by the year 1701 all forms of education except grammar teaching were released from the control of both the ecclesiastical law and the statute law, which imposed licenses on schoolmasters, and thus brought all elementary education under the common law. The ecclesiastical control over grammar teaching was with great hesitation affirmed in the case of *King* v. *Hill* (*Modern Reports*, Vol. XII, p. 518) in 1701, and then came in 1702 the inconclusive case of *Matthews* v. *Burdett*, in which great efforts were made to establish the position that no schoolmasters at all were under the control of the Church. The common law had won the hard-fought battle with regard to the grade of education that mattered in 1702. The old principle had at last been affirmed, the principle laid down by Mr. Justice Hill in 1410: "to teach youth . . . is a virtuous and charitable thing to do, helpful to the people, for which he cannot be punished by our law." It is true that the grammar schools were still retained under the control of the ecclesiastical and statutory law. With regard to these schools the contest was not pressed after 1702. It was useless, as the act of James I clearly applied to them, if the ecclesiastical law did not. The old common law was definitely shut out from the grammar school and by the middle of the eighteenth century the grammar schools of England were empty. J. E. G. de M.

See Bishops' Schools; Church Schools; Dissenters and Education.

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COMMON MASTER OF THE TOWN, THE. — A phrase which connotes a very important stage in the change from the religious to the municipal control of education in English towns during the Middle Ages. The term occurs in the important *Gloucester Grammar School Case* (1410), reported in *Year Book*, 11 Henry IV (ed. 1679, p. 47, case 21). The case deals with the question of educational competition against the cathedral grammar school. The complaint was that a town school had been opened with the result that the cathedral school was compelled to bring down its fees from 40 pence to 12 pence a quarter. In the course of the argument Chief Justice William Thirning said: "If a man retain a master in his house to teach his children he damages the Common Master of the Town [common master del ville]. Yet I believe that he has no action." Clearly the common master held a well-recognized position in England in 1410, and this particular case is only one instance of the struggle and competition which must have gone on between the schools attached to secular religious houses and cathedrals and the free grammar schools, which in many cases were municipal. But the subject requires much more investigation before our knowledge of pre-Reformation education is by any means perfect. J. E. G. de M.

See Common Law in Education.

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COMMONPLACE BOOK. — A book in which passages on different topics are gathered under general heads for purposes of general reference and application. A commonplace, or *locus communis*, is defined by Cicero as a general argument which is applicable to many cases (*De Inv.* II, xiv–xvi, and Elyot, *Governour*, I, xiv). The practice of keeping notebooks into which commonplaces were written was customary among the medieval students. Rudolph Agricola (*q.v.*), in his letter *De Formando Studio* (1534), gives perhaps the best example of the method in which such books should be drawn up: "We should have certain topics, as for example, virtue, vice, life, death, ignorance, benevolence, hate, and others of this kind, the use of which is quite common on all occasions, and, as it were, general, and we should repeat these frequently and refer everything we say, so far as possible, and certainly everything we learn, to these headings." Agricola recommends this method as the best for retaining what has been learned. It will be noticed that most of the topics are of a moral character. The *Loci Communes* of Melanchthon (1525) had a religious content. Erasmus recommends the taking of notes in class, not verbatim as dictated by the teacher, but under headings systematically arranged. The keeping of commonplace books usually accompanied the exercises in declamation (*q.v.*) and disputation (*q.v.*), the notebooks serving for ready reference on the theme under discussion. An excellent example of the commonplace book is that compiled by Milton and published by the Camden Society (*Publications*, Vol. XVI, 1876). The topics are divided into three parts, (1) *Index Ethicus*, (2) *Index Economicus*, (3) *Index Politicus*. Under (1) he deals with *malum morale, de viro bono, de morte, de curiositate*, etc.; under (2) with *de victu, de cultu, de liberis educandis, de servis, divitiae, paupertas*, etc.; under (3) *respublica, amor in patriam, leges, rex, monarchia, tyrannus, de bello, de bello civili*. The commonplace book was naturally transferred to this country, and is early found at Harvard. Samuel Sewall (*q.v.*) defines commonplacing as "the reducing and treating of topics of theology, philosophy, etc., under certain commonplace or general heads" (*Diary*, 1674). Commonplacing as a part of the disputation is referred to as an exercise expected of all sophisters and bachelors (*Laws, Liberties, and Orders of Harvard College,* 1642–1646). The term seems to have been used both of the short sermon delivered by students at the opening of the day's work, and of the regular defending of a thesis at graduation. The commonplace book disappeared generally in the middle of the eighteenth century, although it appears to have been in use in the sixth form at Harrow as late as 1839. (See *American Annals of Education,* Vol. IX, 1839, p. 100.)

The commonplace book, or *Stammbuch,* not only served an educational purpose. In the eighteenth century in Germany the practice arose of keeping autograph albums, in which autographs were accompanied by quotations or original contributions of a literary character. The best German collection of this type of *Stammbuch* is located in the ducal library at Weimar.

Arising out of both these forms of practices is the publication of books of quotations and sayings on any one topic, taken from all languages. A good example will be found in the *Stammbuch des Lehrers* (Stuttgart, 1878).

COMMON SCHOOL ASSISTANT. — See Journalism, Educational.

COMMON SCHOOL EDUCATION. — See Journalism, Educational.

COMMON SCHOOL FUND. — See School Funds.

COMMON SCHOOL JOURNAL. — See Journalism, Educational.

COMMON SCHOOLS. — A somewhat general term, applied to such schools as are supported by general taxation and open to all, and in America practically synonymous with the term "public schools." As sometimes used only elementary or rural schools are meant, but strictly speaking it should include all of the schools provided by the taxation unit referred to. It is so used by the United States Commissioner of Education in the statistical tables referring to the different state systems. In rural districts the term means the "district school." In cities it includes kindergartens, elementary schools, high schools, city normal schools, evening schools, truant schools, vacation schools, and special type schools. When referring to the state it in reality includes the state university as well, though the term is not generally used in such a comprehensive manner. Ordinarily the term is applied to the elementary schools of a city only, the high schools being designated as high schools.

The common school system of the United States, so far as there can be said to be a general system, embraces the 12 years of school work given in the elementary schools (8 years) and the high school (4 years). In the cities the kindergarten is added to the system at the lower end. These schools are intended for children from the age of 6 to the age of 18, and the kindergarten reaches down to 5 or 4 years of age, and in a few states it may reach down to 3 years. As a matter of fact, there is no uniform common school system throughout the country. Any city or town is at liberty to develop its school system in almost any manner that it desires and can afford, and the result is that one finds very limited city systems and very extensive city systems in the cities of the same state. Some cities have an elementary school course of nine years and some of seven years, instead of the eight which is the general rule. The high school, too, in a few places is a six-year high school, made so by including the seventh and eighth grades in the high school; while in other cities the five- or six-year high school course is made by adding what are often called graduate years to the high school, and thus extending the years of education provided. (See article on High School Courses.) In many rural schools the elementary school covers nine years instead of eight. The different American school systems are alike in their nature and purpose, rather than in their extent and plan. E. P. C.

COMMON SCHOOLS, SUPERINTENDENT OF. — See Superintendent of Schools.

COMMON SENSATION. — Aristotle distinguishes the *sensus communis,* or common sense, from the particular sensations and senses. Motion, rest, form, magnitude, number, and unity are properties common to all objects, and hence could not be perceived by the particular sense organs. We must therefore possess a common sense by means of which we may perceive these common qualities or sensations. Later authors, as Sully, have used the term to designate the sensations that have not as yet been analyzed and for which no sense organs are known. Sensations from the inner organs, from the muscles, and from the skin have been put into this class. The number of qualities is constantly decreasing as new organs are recognized and new qualities analyzed from the complex of undifferentiated sensations. W. B. P.

COMMONS. — A term used as early as the fourteenth century for provisions or expenses on food laid out in common. From the practice of living in common at the universities the phrases "keep commons" and "put out of commons," for being in residence and being expelled, arose. At present the word is used to refer not to a whole day's ration, but (1) to the normal quality of any kind of food served from a college kitchen or buttery, and (2) frequently to the building where meals are served to students.

See Universities.

COMMONWEALTH IN ENGLAND AND EDUCATION. — In most school histories it will be found to be assumed that during the Civil War and the Interregnum the school was in abeyance, or, if it is found going on, great surprise is expressed at the fact of what is regarded as exceptional favor to that place. As a matter of fact, the Commonwealth period is one of great activity and new developments in the educational world. The intellectual classes were on the Parliamentary side. The royal party had no names to put in competition with Selden and Prynne, Milton and Marvell. The schools and universities were a special object of the care of Parliament. While Laud drove schoolmasters who expressed ideas opposed to his into prison, like Gill of St. Paul's, or out of office, like Langley of Gloucester, under the Commonwealth, the schoolmasters who minded their own business and did not actually bear arms were left unmolested in their places. The cathedral grammar schools, which are usually supposed to have been the objects of Parliamentary attack or suppression, were specially cared for. Very soon after the war began, on Oct. 14, 1642, the estates of deans and chapters were ordered to be sequestered; but the order contained a proviso that "allowances assigned for scholars and other charitable uses" were not to be interrupted. A year later, the Parliamentary committee for plundered ministers was extended to schoolmasters, and as the order for sequestration of chapter estates gradually became effective, power was given to this committee to relieve poor schoolmasters as well as ministers thereout, while having power to remove scandalous schoolmasters. They acted with judicial fairness. At Canterbury articles brought against Ludd, the master of the cathedral grammar school, on Jan. 22, 1644, were referred to a local committee of members of Parliament and city councillors to examine. On Nov. 25, several members were added to hear Ludd and examine witnesses. On Apr. 4, 1646, his answer and the examinations were sent back to the committee to hear Mr. Ludd again, and eventually he remained and died in office in 1649. Though after Oxford was taken the colleges were naturally purged of those who had actually taken arms against Parliament or who refused to accept the regime, and two thirds of New College was thus removed; yet, as soon as the war was over, the regular succession of scholars from Winchester College was resumed and the vacant places were largely filled by old Wykehamists. When the Provost of Eton ran away to join the King, his place was supplied by one of the most eminent scholars who ever held the office, Francis Rous, afterwards speaker to one of Cromwell's parliaments. Westminster under Busby (*q.v.*) was taken under the special care of Parliament, and a new governing body created by act of Parliament for it. It is remarkable that the two earliest school lists extant are those of Winchester in 1652 and Westminster in 1653, and some of the most famous persons they produced were during that period, *e.g.* Bishop Ken at Winchester and Dryden at Westminster. It was at this time, in 1650, that at Winchester the well-known Latin poem descriptive of the school life, was produced. When deans and chapters were abolished by act of Parliament on Apr. 30, 1649, special provisions were made to prevent Westminster, Eton, and Winchester from suffering in revenue, and the spiritual property of the chapters was given to 13 trustees, and afterwards to a University Reform Committee, for augmentation of salaries of poor ministers and schoolmasters, while £2000 a year was assigned for the universities. Under this provision, the salaries of cathedral grammar schoolmasters of Chester, Chichester, Durham, Rochester, Salisbury, and St. Anthony's School, London, which last was paid from St. George's Church, Windsor, were increased and in many cases doubled; and other schools which were old grammar schools, confiscated by Edward VI and paid out of Crown revenues, received similar increases. The heads of most colleges in the universities got large augmentations. Thus the master of Pembroke Hall, Cambridge, received £70 a year, of Peterhouse £53, of St. John's and Clare, £100; while at Oxford, Wadham, Queen's, and Lincoln received £63, Brasenose, £90, and Balliol and University Colleges £93 a year. The lecturer in astronomy at Oxford was increased, first £50, and then to £80 a year. Immediately before and after the dissolution of chapters the county of Durham petitioned for the establishment of a university college there. But owing to the wars it was not till May 15, 1657, that it was founded by Letters Patent of Oliver Cromwell, with power to acquire lands up to £6000 a year. A provost and 12 fellows were appointed, 24 scholars, and 12 exhibitioners. Next year it petitioned for power to grant degrees. Oliver died, and before the opposition of Oxford and Cambridge was finally settled, the Restoration came and the endowments reverted to what Cranmer called "the fat and lazy prebendaries." It was nearly two centuries before Durham at last, in 1832, got its university from the same source, the suppressed prebends of the cathedral. Proposals were also made for a London university, but not carried out, and London, too, had to wait two centuries for its university.

Two districts especially benefited by the Commonwealth. "An act for the Propagation of the Gospel and the Maintenance of godly and able ministers and schoolmasters" was passed for Wales on Feb. 22, and for the four northern counties of England on Mar. 1, 1650. Several old schools had their endowments increased, while some 24 new schools were established in Wales. But again when the Restoration came, those schools ceased, and Wales had to wait more than 200 years for its Intermediate Education Act, 1888, under which Carnarvon and other places at last received schools. In Durham County alone some 12 new schools were established, while a new departure, for which Charles II and Pepys afterwards got credit, in connection with Christ's Hospital, London, was taken, in the establishment of navigation schools at Sunderland and Nether Heworth. For some reasons unexplained, the county of Dorset, though not included in either of the Gospel Propagation acts, received special favors in the matter of schools, some half dozen being either increased or newly created.

But the most permanent result of the Commonwealth period was the immense impetus it gave to educational discussion in such persons as Samuel Hartlib, John Dury, and John Milton (*qq.v.*), and to actual experiments in education in the schools of John Milton, John Farnaby, and Charles Hoole (*qq.v.*), the first, as all the world knows, a Republican, the two latter royalists, and all in the city of London, while at Bury St. Edmunds, the dispossessed "malignant" master, Leeds, was allowed unhindered to set up a private school, which brought the grammar school to such low water that its governors were fain to have him back again. The liberty of unlicensed schoolmasters, gained by the abolition of the bishops and chapters, was quite as important as that of unlicensed printing. Even the courts of the Restoration were forced, to recognize the liberty that had been gained, in Bate's case, 1670, and Cox's case, 1671, and recognized that schools in arithmetic, writing, French, geography, and navigation were outside episcopal license. (See COMMON LAW IN ENGLISH EDUCATION.) So that a great step forward to modern subjects of teaching and free development was gained, though the new Commonwealth and Protectorate schools died with their creators. A. F. L.

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COMPARATIVE LITERATURE. — See LITERATURE, COMPARATIVE.

COMPARATIVE PSYCHOLOGY. — See ANIMAL PSYCHOLOGY.

COMPARISON. — Similarity (resemblance, likeness) has been recognized since the time of Plato as a fundamental category of knowledge. Aristotle showed that it was one of the two principles of the sequence of ideas in memory and imaginative anticipations and constructions, contiguity being the other. (See ASSOCIATION.) Comparison is the process of rendering the place of resemblance explicit and definite. Without comparison generalization (*q.v.*) is impossible, hence the practical importance of comparison in the training of intellect. It is, however, a mistake to suppose that the mind begins with a number of objects, standing, as it were, on a level in a row, and then, by comparison, extracts from them some common factor. This view, although prevalent in the pedagogical logic of method, omits two important considerations. In the first place, since any and every object is like any other object in some conceivable regard, intelligent comparison always implies specific end or purpose. We would not ordinarily compare an elephant and justice; a square and a rose, not because no points of similarity can be found, but because there is no purpose to be subserved by discovering such points. In teaching, with a view to leading pupils to form general ideas by comparing particular objects, this prerequisite of purpose to motivate the comparison is often overlooked; it is supposed that the mere purpose of getting a general idea is a sufficient motive for making comparisons. Thus the child is told to compare this and that and the other river, or flower, or whatever, so as to find out what they have in common. Under such conditions, confusion and bewilderment, blind groping or mechanical routine, are inevitable consequences. The pupil must have in mind some end with reference to which the objects are to be compared, — erosion, the principle of gravitation, navigability, supply of energy for manufacturers, or whatever.

This suggests the second point. The mind *begins* comparison on the basis of some vague anticipation of common factors; it does not wait for the comparison to terminate before the common factor emerges. Put psychologically, one object suggests some similarity or resemblance which forms the starting point. Comparison then works backward and forward between the two objects with a view to making the vague feeling of resemblance more precise, and more complete, and to ascertain the scope and the importance of the suggested resemblance with reference to understanding the particular matters at issue. The resemblance may turn out, when followed up, to be superficial and trivial, *e.g.* not to throw light upon the objects of study. Or it may turn out to be a key to grasping their significance. In any case, comparison is an act of clarifying and building out a vague and inchoate sense of resemblance, not a method of reaching the common factor in objects having prior to comparison no felt community with one another. J. D.

COMPARISON AND ABSTRACTION. — The "third step" in the method of the recitation or the procedure of the "inductive development lesson" (*e.g.* of Herbart). The transitional stage between the "presentation" of new facts and the induction of a generalization from them, the stage at which the points of resemblance and differences are emphasized through "comparison," preparatory to the "abstraction" of the law, rule, or other generalization which is the product of the pupil's thinking.

See Recitation, Method of.

COMPARISON, METHOD OF. — One of the two special methods employed in teaching facts or forms where confusion exists or is likely to occur, as in the case of spelling in the use of such homonyms as "their" and "there." The method brings both of the confusing factors together, and, by comparison, distinguishes their form and usage. The other and supplementary method is that of "separation," where the form and use of each factor is developed separate from the other. The method of "separation" is most used in teaching young pupils new knowledge, in connection with which confusion has not yet arisen. The method of "comparison" has its more frequent use with old pupils with whom the confusion has already arisen. It is an important "corrective" method, as the method of "separation" is one of prevention. These two means of teaching have their largest utilization in the formal aspects of instruction, where errors of convention are likely to occur, as in spelling, grammar, etc.

See Correction of Errors. H. S.

COMPETITION. — See Interest; Moral Education; Rewards and Punishments; School Management.

COMPETITION, PSYCHOLOGY OF. — It is a well-known fact that an individual is capable of exercising more energy under conditions of competition than he could exercise if he attempted to do work by himself. This increase of energy is due to the increase in stimulation which comes from the presence of others. Indeed, the nervous system of any one engaged in a piece of work is aroused to more energetic action by the mere presence of observers in such a way as to affect the intensity and rate of his work. Mosso showed in his experiments on fatigue that when a subject had reached the limits of his efforts on the ergograph (*q.v.*) the arrival of an interested observer would arouse him to renewed activity. The same general principle is illustrated by the pace-making which is practiced in various forms of racing. The highest speed of a bicycle rider is obtained under conditions which arouse him through competition. The best athletic records are made under conditions of social stimulation. The principle thus illustrated is of importance in educational discussions, because the work of the school is in large measure conducted under conditions of competition. How to regulate such competition in order to secure a maximum advantage without overexciting the individual or reducing his independence and personal initiative are matters which require the greatest attention on the part of teachers. In general it should be said that no competition should be carried to the point where it becomes the chief aim of the student to excel his competitors. Consciousness of social rivalry should therefore be regarded as a danger signal, while, on the other hand, some consciousness of one's rivals is an entirely legitimate motive with which to arouse one's energies. C. H. J.

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COMPETITIVE EXAMINATIONS. — See Teachers, Promotion of.

COMPLEMENTARY COLOR. — A color is complementary to another which gives, when mixed with it (see Color Mixing), in certain proportions, gray, if the result is of sufficient intensity, or white. In general any color of the spectrum between red and green is complementary to some color between green and violet. Green itself is not complementary to any color within the spectrum, but to purple, which is obtained by mixing, for instance, red and blue. Some such complementary pairs are red and blue-green, yellow and blue, yellow-green and violet, green and purple. R. P. A.

See Color Circle.

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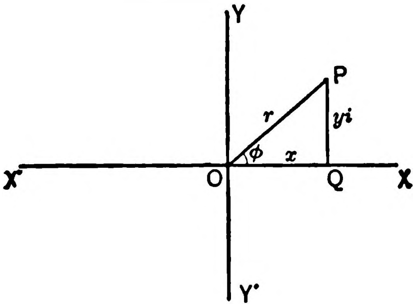
COMPLEX NUMBERS. — A term now used to apply to numbers of the form $a + bi$, where i stands for $\sqrt{-1}$. If $a = 0$, the complex number assumes the form bi, an *imaginary number*, i being the imaginary symbol. Neither name is particularly fortunate. The word "complex" is also used for various other purposes, as to designate a type of fraction in which the numerator, the denominator, or both numerator and denominator, are fractional. The word "imaginary" is misleading, since $\sqrt{-1}$ is no more imaginary, for certain purposes, than are -1 or even $\frac{1}{2}$. We cannot pick up a book $\sqrt{-1}$ times, or -1 time, or $\frac{1}{2}$ time, and yet all of these symbols are perfectly real in certain other cases. Nevertheless the names have been inherited, and so long as their meaning is not taken literally, they serve the purposes as well as other names would.

The ancients recognized the difficulty involved in the square root of a negative number. Heron of Alexandria (*q.v.*) has a problem involving $\sqrt{81-144}$, and he, or his copyist, gets around the difficulty by taking $\sqrt{144-81}$. Diophantus (*q.v.*) has an equation in which the roots are imaginary, but says that it cannot be solved. Bhaskara (*q.v.*), the Hindu (*c.* 1150), states in his algebra that "there is no square root of a negative number." Cardan (*q.v.*) calls these numbers sophistic (1545). The terms "real" and "imaginary" were first applied to the roots of an equation by Descartes (*q.v.*) in 1637.

A number of efforts were made by writers between 1650 and 1800 to make the subject more real, notably by Wallis (1685), De Moivre (1730), Euler (1748), and Kühn (1750). De Moivre developed the important formula $(\cos x+i \sin x)^n = \cos nx+i \sin nx$, and Euler the remarkable consequence that $\cos x+i \sin x = e^{xi}$, from which it at once follows, by letting $x=\pi$, that $-1=e^{\pi i}$. The most important step taken in the direction of making the imaginary seem as real as other artificial numbers was taken by Caspar Wessel (1745–1818), a Norwegian by birth and a Dane by adoption. He presented his famous memoir, *On the analytic representation of direction*, at Copenhagen, in 1797. In this he sets forth the modern graphic representation of the complex number, essentially as it is given to-day in algebra. Various other writers, ignorant of this memoir, soon entered the same field. Of these the greatest was Gauss, who, in 1831, set forth the theory in somewhat the same manner as Wessel.

Briefly stated, the graphic representation is as follows: XX' represents the axis of real numbers, OX being = positive and OX' being negative. YY' represents the axis of imaginaries, OY being positive and OY' being negative. The symbols +, −, i, and $-i$ are considered as symbols of direction, $+a$ being a to the right of O, $-a$ being a to the left, ia being a up from O, and $-ia$ being a down from O. Just as the sum of $+4$ and -3 make a number whose absolute value (value independent of direction) is less than 4 or 3, so $x+yi$ represents a number whose absolute value is not the sum of the absolute values of x and y. This sum is represented by the line OP, or r. This complex number may be represented analytically in several ways, as $x+yi$, $r(\cos \phi + i \sin \phi)$, or $re^{\phi i}$. Sometimes one form is the more convenient, and sometimes another.



Complex numbers are subject to the ordinary laws of operations, being added, subtracted, multiplied, and divided somewhat as other numbers are. These various operations are easily represented graphically.

The subject has recently attracted the attention of teachers of elementary algebra, because of the fact that the complex number appears in the study of quadratics. It is entirely feasible to give a brief explanation of these numbers to a class in the high school, although any clear understanding of the general theory of the graphic representation on the part of the pupils is not to be expected. Many algebras at present give such a brief introduction to the theory. D. E. S.

COMPLICATION. — Whenever a memory image is so intimately related to a present experience that the mind is unable to discriminate between those elements of experience which are now presented to the senses and those which are drawn out of memory, a complication is said to arise. An example of such complication is seen in the experiences derived from words where the sound or the visual sensations which arouse the experience of the word cannot be distinguished by the listener or reader from the interpretations which he immediately adds to the sounds or the visual image. Another illustration is to be found in the example of the person who sees a white object in the dusk and mistakes it for a ghost. He does not distinguish between his visual sensation and the interpretation which comes from his excited experience. It is important that teachers recognize the fact that most experiences are complications, so that they may realize the difficulties which the pupils have in arriving at a full understanding of what is in the teacher's mind when teacher and child have the same sensory material, but totally different memory images acting upon this material. C. H. J.

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COMPOSITE NUMBERS. — See Numbers.

COMPOSITION. — The "putting together" of lines, masses, and colors to create a harmony.

See Art in the Schools; Art, Method of Teaching; Design; etc.

COMPOSITION. — The term "composition" is applied to the grouping of figures or other objects in painting and sculpture, and to the grouping of ideas in language. In each case the end sought by such grouping is the attainment of certain general effects in the whole work. It is of the grouping of ideas expressed in words that this article treats.

Though the terms "rhetoric" and "composition" are frequently found together, and sometimes confused, they properly designate two quite distinct phases of the subject. Rhetoric is concerned with the theoretical side, with the laws of expression. The term "composition" means (1) the application of those laws, consciously or unconsciously, in spoken or written discourse, or (2) the discourse itself. A treatise on rhetoric is a systematic presentation of the laws of discourse, generally illustrated by specimens of such discourse. Composition is therefore an art, as distinguished from a science. It is, moreover, an art that is in constant employment by all normal people, either in its spoken or written form; though the difference is very great in the skill with which the art is practiced by different people.

The four fundamental processes of composition are distinguished by the ends they have in view: narration, which aims at telling a story, or a succession of incidents; description, which aims to describe or portray, and which most commonly makes its appeal to the visual imagination; exposition, whose purpose is to explain; and argument, whose purpose is to prove some proposition. While the distinctions among these forms are often convenient in instruction, it must be remembered that the various forms are seldom found entirely distinct. Narration and description are often found in the same composition. Moreover, the methods of the two are often so closely alike that it is difficult to say of certain passages to which of the two processes they belong. Exposition and argument are often found together, though the line between them is easy to draw. But exposition and description again often overlap each other. The full treatment of them belongs to the theory of rhetoric rather than to the art of composition, and finds no place either in the modern textbook of composition or in the work of the teacher. Of these four processes exposition is by far the most common both in written and in spoken language; narration comes next in order of frequency. Except in literary works, descriptions are usually limited to a few words. Except in formal presentations of propositions in law, science, or the like, arguments seldom proceed beyond a few sentences.

Composition looks rather to the end to be attained, *i.e.* the effect to be produced, than to the employment or the practice of any one of these type forms of writing, though the laws of each must often be consciously used by the writer. In scientific exposition or in serious argument, however, it is necessary to adhere more closely to the type.

The Teaching of Composition. — Within the past twenty-five years the art of composition has assumed far greater importance than before. So long as the ideals of classical study ruled the schools, and culture was thought to come principally from a knowledge of Greek and Latin, expression in English was neglected by teachers. With the breaking away from the classical tradition, and the increased recognition of the educational value in the study of modern life and environment, the minds of teachers turned more and more toward instruction in the mother tongue. The beginnings of the movement go back, indeed, to the days of Franklin and Jefferson. But the general movement even in some of the more backward schools cannot be said to have become established before 1885. It is now usual to find composition given a large share of the time of the program, and taught as a vital subject rather than in the occasional and perfunctory fashion of former days. It is now recognized as a subject of the greatest utility, inasmuch as every one depends for his pleasure and success in part upon his ability to express his ideas agreeably and effectively. It conduces to clearness and definiteness in one's thoughts, to care in ordering and expressing them. To have tried conscientiously to say things well helps in the appreciation of things well said, and therefore adds to the enjoyment of literature. And command of one's native speech puts one into closer touch with the social and national life about him. Such are the principal arguments by which the present important place of composition is defended.

Especially noteworthy are the changes in the methods of instruction. Theory has given place to practice; it is fully realized that one can learn to speak and write only by speaking and writing under stimulus and guidance. Rhetorical rules are worth nothing except as applied. The earlier teaching aimed at a sort of lifeless accuracy. Verbal and grammatical correctness, propriety in spelling and punctuation were sufficient. The present-day teaching of the better sort judges the child's efforts not only for these things, but for the interest and general effectiveness of the whole composition. Has he done with the subject what he should have been expected to do? Does his composition show that he has remembered and thought; that he has ordered and arranged? Such is the standard now set up, adapted though it must be to the child's age and capacity. In accordance with these standards the training is not in the lesser units of words and sentences so much as in paragraphs and whole compositions.

Through the influence of modern linguistic scholarship another influence is slowly working its way into the schools. Under the older (and erroneous) conception of language as a fixed and absolute thing, teachers often set up a rigid standard of grammatical and rhetorical propriety that could not be justified either from literature or from the speech of a large body of educated people. This standard, under which most teachers of the present day were educated, is slowly giving way before the conviction that a considerable latitude must be allowed in the choice of words and expressions; the conviction that it is often impossible to say, as between two expressions, that one is right and the other is wrong.

More and more the tendency is to have the pupil write of the familiar and concrete, of the things within his own daily experience, instead of the abstract and remote. It is realized that he can learn to write and speak best when dealing with simple and familiar things. Such material commonly includes also his school work in other subjects than English. Themes drawn from his readings in literature may well be included, but must be chosen with careful reference to the limitations of children's minds.

Composition is recognized as a difficult art, involving, as it does, not only the expression of ideas, but the gathering and arrangement of them. So far as possible these two tasks should be divided. When the subject is chosen, it should be worked over and discussed in various lights, until the pupils can talk of it with some degree of freedom. The writing should be begun only after the pupils have gained some confidence in their ability to talk of the subject, and, in the later years, are able to outline it with a fair degree of clearness. Outlines made by the pupils themselves are an aid to both confidence and clear thinking.

In the elementary school the work in composition may be easily carried into other school studies, inasmuch as they are usually all taught by the same teacher. In the high school, however, the divorce between English composition and other subjects is an evidence that our systems are still imperfect. As long as the pupil speaks and writes carelessly in other departments, so long will the work of the English teacher fail to form good habits. Not until all teachers coöperate can we hope for the best results attainable.

As to the time of beginning the training in composition, and as to the amount to be required, there is still considerable divergence both in theory and practice. In some schools no work in formal written composition is done earlier than the third year; in others the pupils write simple reproductions of short and simple stories in the first year. It is as yet unproved which is the better plan. But there is general agreement that in these early years all the composition work should be as easy and spontaneous as possible. It is to be remembered that the oral work done even in these first years is also composition. As to the question of how much writing should be employed there are again differences of opinion. In general, however, it is agreed (1) that short exercises are better than long, for the long ones tend to produce either discouragement or prolixity; (2) that some writing should be done every day, the subject often being drawn from some of the school studies; and (3) that, if consistent with the foregoing rule, the pupils should not write more than the teacher has time to read.

This leads naturally to the question of criticizing the pupils' efforts in expression. The oral work should be carefully watched. Errors and carelessness alike should be corrected, generally when made, except when such interruption interferes with the pupil's thinking. The criticism of the written work is the only means of insuring its effectiveness. A few general principles, now commonly accepted, may be stated. Pupils are to be made as much as possible self-critical and self-helpful, though care must be taken not to develop their self-criticism to the point of inhibition. They must be held responsible for things once learned. Generally the written work, after the teacher has corrected it, should be returned to them, be worked over by them, and again submitted for inspection; for if the criticisms made are not applied, they are useless. Work obviously careless in form and matter should not be accepted, if the teacher would have the pupil's respect and value the subject. But the criticism must not stop with these more mechanical matters. The work must be judged for its ideas. And, speaking relatively, the pupil must be led gradually to value his and other work for the ideas he has got into it, as well as for the clearness and effectiveness with which the ideas are conveyed. For this there is no better means than reading the compositions aloud, having the class as a whole help in passing judgment upon each other's performances. In all the work of criticism the teacher's true function is not that of the fault finder, but of the stimulating and helpful guide. If freedom and accuracy are to be attained, there must be a certain amount of drill. Frequent practice in dictation will help in giving control and facility over the forms of words and sentences. Of considerable value also is practice in saying the same thing in different ways. In brief, the work will be effective in proportion to the teacher's skill and resourcefulness.

Most of the general principles that apply to the work in the elementary school apply also *mutatis mutandis* to the high school. As has been said above, the high schools, like the elementary, have given prominence to the work in composition in recent years. This is due in part to the demands of the colleges that their students must, at entrance, give evidence of a good course in English, and in a greater degree to the belief, on the part of the high school teachers themselves, in the value of such instruction. It is especially to be noted that those high school courses which are not directly preparatory to college commonly give more time to instruction in English than is contained in the college preparatory courses. For a considerable period the desire to unify the course in English, and especially the literature and composition, led to forced relations that were not to the advantage of either. Pupils were required to write too frequently on literary subjects that were beyond their grasp, with the result that the compositions were insincere and futile, and the pupil's love of literature hindered rather than helped. At the last meeting of the National Conference on college entrance requirements in English (1909), in which both college and high schools were fully represented, a report was adopted which, it is hoped, will tend to put the composition work on a sounder basis. One of its most important recommendations was that a considerable part of the composition writing should be upon such experiences as come within the pupil's daily life and observation. That the report was in harmony with the judgment of the best teachers appeared from the way in which it was received.

F. T. B.

See College Requirements for Entrance in English; Literature, English; Rhetoric.

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COMPOUND NUMBERS. — This is a term that has long been used in arithmetic to denote numbers in which several different denominations enter, as in the case of 3 ft. 7 in., or 2 hr. 3 min. 48 sec. Such numbers arose from the necessity among the ancients of avoiding fractions (*q.v.*), which were the stumbling block of all antiquity. Instead of writing $2\frac{3}{4}$ ft., the person unfamiliar with fractions could write 2 ft. 9 in., and so for similar cases. (See Measures.) The same effort is seen in the use, by scientists, of the sexagesimal fraction. (See Fractions.) With the rise of the Arabic notation (see Notation) in Europe, from the thirteenth to the fifteenth centuries, the writing of fractions became more simple, and with the invention of the decimal fraction the use of compound numbers becomes less imperative. For the last 300 years, therefore, these forms have gradually lost their standing. The adoption of the metric system in the nineteenth century, in a large part of the civilized world, rendered practically obsolete a considerable part of the work in compound numbers. Therefore, at the present time in America, we have only feet and inches as the universal example of a compound number. We rarely hear any more of gallons and quarts together, or of yards and feet, or of miles and rods, or even of pounds and ounces. Meat, for example, is bought by the pound, half pound, and quarter pound, and not by the pound and ounce, and similarly for other commodities. As a result of this tendency the teaching of compound numbers is at present less formidable than it was in the nineteenth century. With the exceptions of expressions involving time, numbers involving more than two denominations are practically eliminated. The four fundamental operations are therefore reduced chiefly to numbers involving feet and inches, time, and enough other denominations to give some practice in the use of the tables.

D. E. S.

COMPOUND TONE. — Whenever two rates of sound vibration strike the tympanic membrane at the same time, there results a compound sensation. In the physical world there is a compounding of the air vibrations affecting each particle of air which is set in vibration. In certain cases, described under difference tones and summation tones, compound sensations are produced which have no parallel in the physical world of air vibrations. The special character of a compound stimulation in the sphere of hearing is due to the fact that all compound tones and all compound effects of any type are analyzed in the inner ear, and nervous currents are sent to the central nervous system corresponding to the various elements of the compound. The ear as an analyzing organ thus restores in conscious experience the complexity of external vibrations which were for the moment fused in a single vibration of the tympanic membrane and the outer organ of the ear.

C. E. S.

COMPREHENSIVE METHOD. — A special plan or system for the teaching of reading to beginners which comprises several special methods of instruction. It is one of the current textbook systems of teaching children to read in which specific steps and extensive exercises are provided.

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Gordon, E. K. *Comprehensive Methods of Teaching Reading.* (Boston, 1903.)

COMPULSORY ATTENDANCE. — See Attendance, Compulsory.

COMPULSORY EDUCATION. — See Attendance, Compulsory.

COMPULSORY SUPERVISION OF EDUCATION. — See Supervision of Teaching.

COMPUTE. — From the Latin *computare,* to reckon, from *com-,* together, and *putare,* to think, reckon, or count. In elementary teaching the word is used as a synonym of "calculate" (*q.v.*) or "reckon." In the Middle Ages it was used with particular reference to the computation of the calendar.

See Calendar; Computus.

COMPUTUS. — A term used in the Middle Ages to designate that portion of arithmetic relating to the calendar (*q.v.*), a subject that played the same important part in the ceremonies of the Christian Church as in earlier religious worship. The subject was known by various names, such as *computus paschalis* and *computus* *ecclesiasticus*, but was commonly called simply *computus* or *compotus*. The latter spelling was at one time the more common, as in the following definition from an anonymous manuscript of the fourteenth century: *Compotus est scientia numerationis et divisionis temporum.* It was entirely in accord with tradition that the work of regulating time should have been in the hands of the priests, since they had assumed this duty from the remotest antiquity. It was a relic of the days of sun worship, equinoctial festivals, orientation of temples, and of the various forms of celestial mysticism that finally developed into the science of astrology. The annual nail in the Roman temples, the sun-dial on the church wall, the indication of the hour by the tolling of the bell, and finally the clock in the belfry are all evidences of this tendency. The problem of the Christian Church was particularly complicated because it was found advisable for it to adopt so many customs which its converts were loath to sacrifice. The greatest of all the problems of the *computisti* was to fix Easter Day. It appears first in a noteworthy way in a work by Victorius of Aquitania (457 A.D.), and a century later it appears in a *Computus Paschalis* (562 A.D.), possibly by Cassiodorus. In 664 A.D. the question became so complex as to cause a serious conflict between the English and Roman ecclesiastics. The best of the early works on the subject was written by Bæda, the venerable Bede (*q.v.*), in the eighth century, under the title *De temporum ratione.* A century later Rabanus Maurus, *primus praeceptor Germaniae*, wrote upon it, and so important did Alcuin and Charlemagne consider it that the former wrote upon it and the latter prescribed it as a study for every monastery. In the universities of the thirteenth and fourteenth century lectures were commonly held upon the subject, and the learned Sacrobosco (*q.v.*) wrote a *Libellus de anni ratione, seu ut vocatur vulgo computus ecclesiasticus* for the use of students. The first printed computus is that of Anianus (1488). The subject naturally found place both in the early printed arithmetics and in the church manuals. Thus Köbel in his *Rechenbuch* of 1531 devotes ten pages to it, and this custom explains the presence of the discussion of the Julian and Gregorian calendar in the American arithmetics of the nineteenth century. A good idea of the medieval computus may be obtained to-day from the Prayer Book of the Church of England or the American Episcopal Church.

We have certain relics of the computus in common use at present, as when we speak of "a red-letter day," and when we repeat the rhyme beginning, "Thirty days hath September." This rhyme, first found in print in English in 1590, appears in Anianus in Latin, but goes back at least as far as Sacrobosco, in whose computus it appears as *Sep. No. Iun. Ap. triginta dato, reliquis magis uno. Ni sit Bissextus, Februus minor esto duobus.* The word "computus" was also used to mean an account, as in a document of 1316, beginning "Computus of Robert Oldman, reeve of Cuxham, from the morrow of St. James, in the 10th year of the reign of King Edward." D. E. S.

COMTE, AUGUSTE (1798-1857). — French philosopher; born at Montpellier in 1798 and died at Paris in 1857. He was educated at the Polytechnic School at Paris. About 1820 he became the pupil and disciple of Saint-Simon, who, observing the aptitude of his mind, intrusted to him the preparation of a Positive Politic, which, however, proved unsatisfactory, but evidently influenced the young philosopher, for, in 1826, he began a course of lectures, soon discontinued on account of a cerebral derangement, but resumed in 1828, in which the germs of his own system are already apparent. From 1832 to 1852 he was tutor of mathematics and examiner at the Polytechnic School, where he lived the quiet and uneventful life of a teacher and writer. The chief works produced during this period are the *Cours de Philosophie positive*, 1839-1842; the *Système de Politique positive*, 1851-1854; and his *Catechisme positive*, 1853. In his philosophy the two chief points are: (I) His idea of the evolution of human knowledge. He maintained ~~that there~~ are three stages in the intellectual development of the race, and, so far as these stages represent typical forms of knowledge, in the individual; namely, the *theological* stage, in which man refers phenomena to the immediate action of some supernatural being; second, the *metaphysical* stage, in which abstract forces or essences are used as explanatory agencies; and third, the *positive* stage, which refers all phenomena to the operation of general laws, observed in the immediate behavior of the phenomena themselves. This idea led him to a particular classification of the sciences, upon which, he maintained, the education of the people must henceforth proceed. This hierarchy he arranged as follows: (1) The sciences of number (arithmetic, algebra, geometry, and mechanics); (2) astronomy; (3) physics and chemistry; (4) biology and physiology; (5) social physics or "sociology." He further maintained that in this classification each science depends on the truths of all the sciences which precede it, plus such truths as properly belong to it. Thus sociology includes all the preceding sciences and adds new data to them. Moreover, each group passes through the three stages of the evolution of knowledge; but inasmuch as the theological and metaphysical stages are now practically at an end, the final, or positive, stage, which synthesizes and coördinates all knowledge for the good of humanity, is the only one that will survive in the future. (II) The second part of his philosophy is the direct outcome of this conclusion; for Comte's political and sociological doctrine connects directly with the positivistic stage now emerging. The first to coin the word "sociology" to include the whole of the positive doctrine of philosophy, he regarded society as an organism, with humanity as the main object of study; social law excluding any real freedom of the individual. As regards education, he taught that the hope of further progress lay in the economic and civil enlightenment of the great units of the social organism, the family, the State, and the "Church." And for this purpose, of course, science must be the chief means of culture. Comte, however, only gave himself incidentally to the study of educational theory and practice, his promise, made in the *Cours de Philosophie positive*, of a special treatise on pedagogy never being fulfilled; but the chief points of his system may serve as a clew to the scattered suggestions found in his works. Thus he maintained that (1) The education of the individual must be based on the idea of the "stages" of knowledge and be adapted to the civilization reached in the modern, or positivistic period. (2) Mathematics, accordingly, form the chief point of departure in the process. Concrete and physical studies are not first in his view. (3) Education must be universal, and no discrimination should be made between rich and poor in this respect; but the training of the school must be adapted to the needs of the units, while maintaining the integrity of the system, which, he said, is "constantly similar and identical." All questions of method must be determined according to science, *i.e.* they must be positive, for it is only along this line that the expectation of fuller knowledge and greater social efficiency can be fulfilled.

H. D.

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CONÆSTHESIA. — In certain individuals the stimulation of an organ of sense arouses experiences appropriate to some other sense. Thus such an individual on hearing a high, shrill tone sees the color red. This is not a mere association of memory images, but a joint action of sensory centers, probably due to some central connections.

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CONATION. — See Volition.

CONCENTRATION. — The grouping of the work of the school around some central subject. Everything is studied as a phase of this subject, or as contributing to its better comprehension. The core subject may be one of the ordinary studies of the curriculum, or it may be some more universal one, selected because it seems adapted to the task of unification better than any special subject. Concentration may fairly well be characterized as the extreme type of correlation (*q.v.*). Subjects are made to support each other by being reduced to phases of one large subject. This method of organizing the course of study undoubtedly favors the highest degree of unity. It proceeds essentially upon the principle that there is an unitary aim of education which is best realized through some fundamental study, and that, in order to contribute to the aim, all other subjects should be subordinated to this.

In general four types of concentration may be distinguished on the basis of the subject chosen as the core of the curriculum:

(1) *Concentration about history* is the scheme of Ziller (*q.v.*), a follower of Herbart (*q.v.*). It is based on the idea that the aim of education is the development of character. Now, although ethics seems to be the subject contributing most directly to human character, it is evident that, if it is to prove educative, it must be given content by being related to a body of concrete knowledge, and made interesting and potent with the will. This result is accomplished through history, which may be defined as the study of concrete ethics, or ethics in action. The selection of history as the core subject enabled Ziller to arrange the course of study according to the plan of culture epochs (*q.v.*). Literature, art, and even science were studied according to the principle of historical development. This method is especially difficult of application to science, for it involves the study of abandoned scientific ideas before we take up those of the present, and, moreover, renders it exceedingly difficult to give either a reasonably complete or practically useful view of any science. The latter difficulty seems, even when the culture epoch theory is not employed, inherent in any plan of concentration that uses the humanistic studies as a center.

(2) *Concentration about universal science.* The modern reduction of the humanistic studies to a rationalistic or scientific basis enabled the development of the conception of a universal science dealing with the logically progressive exposition of universal law. Such encyclopedic schemes as those of Comte and Spencer (*qq.v.*) are the outcome of this idea. They find expression in the scheme of concentration about what may be called universal science, of which each subject, when properly studied, constitutes an integral part. Here we have the notion so elaborately developed by Colonel Parker (*q.v.*). He regards the aim of education as comprehensive intelligence, insight. His plan has been criticized as laying too much stress upon the scientific as contrasted with social, ethical, and artistic interests, and as considering rather the logical than the psychological order in the arrangement of the material of instruction. It is interesting to note that Colonel Parker emphasized especially geography, as embodying the principles at the development of which he was aiming.

(3) *Concentration about geography and economic subjects.* The Herbartians in the United States have been prone to emphasize geography as, perhaps, the best center for concentration. When defined as the study of the earth in its relation to human life, it becomes a connecting link between the humanities and science. Professor De Garmo especially has developed a scheme, which he calls one of coördination. He would have three centers of concentration in the curriculum, language and the humanities, mathematics and the sciences, and a third group, which he calls the economic core. This deals with the subjects which bear on the methods by which man accomplishes his aims in the world of nature and society. The elementary phase of the economic subjects appears in geography. It is evident that this group constitutes the natural outcome of the other two, and so may be regarded as the core of the whole curriculum. In this event the scheme is in the last analysis one of concentration about those studies that make for the educational aim of practical efficiency.

(4) *Concentration about the social life of the school.* It is evident that while Ziller's scheme erred in making inadequate provision for science, Colonel Parker's plan tends rather to the other extreme of rationalism, neglecting somewhat the æsthetic, moral, and religious, as well as the historical. The plan of making the school work center about a school society, which was advocated by Professor Dewey, restores these factors to a leading place. Such a society can, he thinks, be made fairly representative of life. Hence the various special subjects will rise naturally out of a deeper study of its problems. Thus we have, not this or that phase of life, but life itself, as the central subject of the curriculum. The school society cannot, of course, be very complex for the little child. But as the pupils grow older their group activity can evolve until it approximates to the typical social life of today. Two methods governing the development of this society may be employed. It may represent in its successive phases the culture epochs of civilization, or it may begin with reproducing and studying the life of the neighborhood, and gradually enlarge its sphere until the typical social activities of the world have been covered. As the scheme of Ziller aims at moral character, that of Colonel Parker at comprehensive insight, and that of De Garmo at practical efficiency, so that of Dewey may be said to aim at social efficiency. E. N. H.

See CORRELATION; CULTURE EPOCH.

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CONCENTRATION, PSYCHOLOGICAL. — Mental activity is most effective when it is limited to a narrow range of application, hence concentration of attention leads to great vividness and usually to clearness and distinctness of experience. Diffusion of attention is the opposite, and is closely related to distraction. See ATTENTION.

CONCENTRIC CIRCLE METHOD. — A special method of arranging a course of study in a school subject, or a special method of teaching a subject or topic. It involves the idea of treating the field a number of times, each successive treatment involving a more extended knowledge. In practice, it is quite similar to the " spiral " method of procedure, though theoretically the "spiral " method involves a continuity in the treatment of the subject or topic, which the " concentric circle " method does not imply. Both methods, however, involve the idea that subsequent treatments of the field will have an enlarged scope. Both methods are opposed to the older "logical" method which attempted to teach a topic through one treatment, more or less thorough and final. These methods have been used and discussed largely in connection with the teaching of arithmetic. They have appeared in other subjects, however. H. S.

See ARITHMETIC, TEACHING OF; SPIRAL METHOD.

CONCEPTION. — A term describing a general principle or class as grasped by the mind. "Conception" is generally used of the act or operation of grasping the general or universal, while " concept " is used for the product of the operation. No point has been more disputed in logic and philosophy than the true nature of the general. In the Middle Ages it was long the chief battleground of metaphysical and theological controversy, the extreme and Platonic school, called realists contending for the superior and prior reality of the universal in respect to the individual; while the nominalists held that individual things are alone truly real, and that generality is found only in the words which are applied to a multiplicity of particulars. Between these two schools stood the doctrine of moderate realism, which was finally the official victor. It held that while universals have no separate existence, things are characterized by common properties and relations, so that universals exist in things, and, indeed, confer that intelligible character upon things which makes them susceptible of definition, classification, and demonstrative knowledge. At a later time, conceptualism was offered as a compromise doctrine; things are all particular and separate, but the mind, on the basis of their resemblances, forms an abstract idea of what they have in common, so that ideas, not things, not words, are the true generals. While this doctrine has doubtless been the most current of all the views, in the last few centuries, it is probably the least satisfactory of any. It involves an evasion of the question at issue, for while proclaiming that generality attaches only to ideas, it holds that the general idea is itself based on the resemblances or common factors of objects. This is either the doctrine of moderate realism in another form, or else it renders science impossible by denying the existence of relations among objects and making resemblance a purely subjective feeling. Moreover, since Berkeley, it has been generally doubted whether an idea is, as an existence, any more general than any other occurrence. In recent years the debate has shifted in part to the question of the nature of law, and uniform relations among objects, and in part to the question of the nature of meaning (*q.v.*). The educational aspects of the question are discussed under the latter caption, to which the reader is accordingly referred. Psychologically, the present tendency is to seek for the general in attitudes and functions rather than in existences whether of a metaphysically, physical, or psychical type.

J. D.

CONCEPTION COLLEGE, CONCEPTION, MO. — See BENEDICTINES, EDUCATIONAL ACTIVITY OF.

CONCERT RECITATION. — An oral exercise or drill in which the pupils respond in unison. Previously it was much used to develop pronunciation in the reading period, to master the addition, multiplication, or other tables in arithmetic, to memorize literary selections, etc. The use of concert recitation or oral class drill is decreasing. Other methods of memorization are supplementing the oral; and more individual and less mechanical means are supplanting the formal, vocal responses. Its most efficient use is at present found in the teaching of music.

H. S.

See MEMORIZATION; RECITATION, METHODS OF.

CONCORD, THE SCHOOL OF PHILOSOPHY AND LITERATURE. — This unique and in many respects typically American educational effort was foreshadowed in a scheme described by Emerson in his letter to Margaret Fuller, dated Aug. 16, 1840. He wrote: "Alcott and I projected the other day a whole university out of our straws," to be located in some country town, — Concord, Mass., being one of those suggested. After listing men and the topics which they should teach, he seems convinced that "we might make a puissant faculty and front the world without charter, diploma, corporation, or steward." Thirty-nine years later, the Concord School of Philosophy and Literature became a fact. The aim of the school, promoted by A. B. Alcott, F. B. Sanborn, R. W. Emerson, W. T. Harris, H. K. Jones, and others, was to advance and diffuse philosophical and literary culture by means of conferences and conversations. As its organizers more fully stated, it designed "to bring together a few of those persons who, in America, have pursued or desire to pursue the paths of speculative philosophy, to encourage these students and professors to communicate with each other what they have learned and meditated, and to illustrate, by a constant reference to poetry and the higher literature, those ideas which philosophy presents."

The first session of the school was opened in Alcott's study at the "Orchard House," and continued six weeks during the months of July and August, 1879. Later the "Hillside Chapel" was constructed near by, and afforded more convenient accommodations. Later sessions were at first five weeks, then four weeks, and after 1883 two weeks only. The tenth and last session, in 1888, lasted one day only, and was a service memorial to Alcott. Representatives from 22 states of the Union were among the 400 attendants at the first session, one fourth of whom were residents of Concord. The type of students for whom provision was made is indicated in part by this statement appearing in the circulars: "No preliminary examinations are required, and no limitations of age, sex, or residence in Concord will be prescribed; but it is recommended that persons under eighteen years should not present themselves as students."

The programs of the sessions comprised courses of lectures as well as many single lectures by well-known scholars. During the first five years rather extended programs bearing on philosophy and literature were carried out. The sixth year was devoted mainly to the genius and character of Emerson (1882), the seventh year to Goethe's genius and work, the eighth year to Dante and Plato, and the ninth year to the philosophy of Aristotle and its bearing on modern thought. Among other themes treated were speculative philosophy, history of philosophy, the philosophical systems of Kant, Fichte, Schelling, and Hegel, pantheism, psychology, political philosophy, Greek life, literature, and religion, and æsthetics and art. In addition to the organizers of the school already mentioned, the following leaders, among others, in American thought and scholarship, contributed to its several sessions: John Albee, John Bascom, Mrs. E. D. Cheney, Thomas Davidson, John Fiske, Julia Ward Howe, G. H. Howison, William James, J. S. Kedney, James McCosh, E. Mulford, G. S. Morris, Benjamin Peirce, Noah Porter, D. J. Snider, and John Watson.

There was no "school of thought" developed out of these courses and single lectures, conferences and conversations. Each mind was perfectly free to present and to receive the truth according to its own conviction. But the school was more than a local incident. Springing from the midst of the New England Transcendentalism (*q.v.*), and welcoming the newly developed study of the history of philosophy by Americans, its outcome tended to move in a certain direction. It attempted to analyze the essential ideals that should serve the newer life of the west. "In order to know what to teach and what to receive we must seek through philosophy the one central principle on which the world — the universe — rests. Then we have to trace this back again from that, through all its manifestations in religion, government, literature, art, science, and manners. . . . At a time when Germany is overpowered by the influence of Mill, Spencer, and Darwin, and this genius of materialism is getting so strong a hold everywhere, it is interesting to find that the Concord School reasserts with breadth and penetration the supremacy of mind. . . . But it must not be supposed that the School is hostile to science; on the contrary it approves and heartily sympathizes with it in its great work, which, properly regarded, it considers tributary to the highest ends of existence." (*Harper's Weekly,* Aug. 19, 1882, p. 516.) Many of the lectures were published in the *Journal of Speculative Philosophy,* and elsewhere, and Griggs' series of Philosophical Classics may be regarded as a product of the association of its respective authors at the school. Some publications by the school are mentioned in the literature below.

The positive service performed to the country by these active and thoughtful scholars coming together in this unique manner should not be overlooked. An informal organization, disconnected with any institution, and born largely out of the interests of the individuals concerned, it was an interesting experiment at a summer school before the latter was regarded as a possible, not to say a necessary, addition to our colleges and universities. It also served a widening educational purpose before the approaching organization of the graduate schools of philosophy in a number of universities in the decade following its close. It was also a forerunner of that movement which later issued in the formation of the American Psychological Association and the American Philosophical Association and similar societies which continue its general function of bringing leaders together for discussion. E. F. B.

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CONCORDIA COLLEGE. — The name of a number of institutions of the Evangelical Lutheran Synods, located at Conover, N.C., Fort Wayne, Ind., Milwaukee, Wis., Moorehead and St. Paul, Minn. These institutions give a six-year course of study modeled after the German gymnasium, but none of them are parallel or equivalent to the public high school plus a collegiate course. The courses are preparatory to Lutheran Theological Colleges.

CONCRETE AND ABSTRACT. — Since the time of Pestalozzi, educators have been familiar with the maxim of proceeding from the concrete to the abstract. Viewed as a protest against neglecting individual objects and events, and against beginning with verbal definitions and rules, the maxim was both needed and intelligible. Viewed as a philosophic principle, however, modern logic has shown it to be defective and misleading. The mind does not begin, strictly speaking, with concretes and work toward the abstract; it begins with a blur, "a blooming, buzzing confusion" (James), which is general in the sense of vague, lacking adequate determination, and which is particular in the sense of local and temporary. From this, the mind works in the directions both of the concrete and the abstract; the gain in concreteness representing the growth of definitely marked out individuality, the gain in abstraction, the more precise recognition of the characteristic quality and relation which makes the individual object what it is. Concrete and abstract are thus correlative ideas: ideas that go coupled. Linguistically, they are represented by the relation of noun and adjective, verb and adverb. At first sight, it is more obvious that an adjective or adverb cannot exist alone than that a noun or verb cannot. But slight reflection will show that a thing without a quality, an action without a mode or manner, is as impossible as the converse, and that adjectives and adverbs are frequently omitted only because they are so necessary and so well understood that they may safely be assumed and omitted, leaving the mind free to note explicitly only inconstant qualifications. It would be fortunate for both logic and education, if the word "concretion" were in as current use as the term "abstraction"; for it would serve to remind us that the concreteness of an object is not equivalent to its physical or sense existence, but represents an intellectual achievement, due to combining constant qualities and relations (the recognition of which involves abstraction) in uniform ways. What is ordinarily called concrete means anything as to which this combining or synthetic act has been repeated so often that it has become habitual and automatic. J. D.

CONCRETE NUMBER. — See DENOMINATE NUMBERS.

CONDENSATION OF EXPERIENCE. — Shrinkage in conscious content. The sensory content of mental experiences tends to sink below the level of consciousness or disappear, though at the same time it forms the clew to the interpretation of the experience. In other words, the experience acquires a meaning, while the awareness of that which supplies the meaning no longer remains, but leaves in its stead an attitude devoid of explicit sensory content. This tendency of experience in the direction of condensation is a general characteristic of the mental life. Few of our experiences are as full of content as seems to be revealed by careful introspective or experimental analysis. In perceptual experience, for example, experimental analysis reveals the fact that perception of the third dimension (depth) is largely dependent upon the difference in the retinal images in the two eyes. This difference is, however, unnoticed in favor of the meaning of the total experience; that is, the difference is perceived or interpreted as meaning depth. The sensory elements of the experience become fused, explicit awareness of the difference in the retinal images disappearing. In a similar manner all objects which we perceive tend to become less rich in sensory content as we become familiar with them, while an active attitude toward the object remains and expresses itself in an habitual form of reaction. Condensation is also characteristic of conceptual thinking, as may be shown from the distinction between conceptual and practical judgments (Hobhouse). A practical judgment is based upon the concrete revival (memory) of a former experience; the conceptual judgment is based upon many former experiences, which, however, are not present in consciousness except in the condensed form of an attitude governing the resulting action. Experiment has shown that children tend to think in terms of the revival of concrete experiences, while adults depend more upon condensed forms of experience.

E. H. C.

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CONDILLAC, ÉTIENNE BONNOT DE (1715–1780). — French philosopher. As a young man he was appointed tutor to the Duke of Parma, and wrote several of his essays as portions of a course of study for his pupil. Condillac started philosophically from Locke's empiricism and attempted to work out a pure sensationalism, maintaining, against the faculty theory prevalent in his day, that there are no features in experience which are not present in mere sensation. In his plan of education Condillac urged the early training of reasoning against exclusive memory work; and observation and experiment instead of verbal instruction. The most important writings of Condillac are: *Essai sur l'origine des connaissances humaines; Traité des systèmes; Traité des sensations,* and *Cours d'études.*

K. D.

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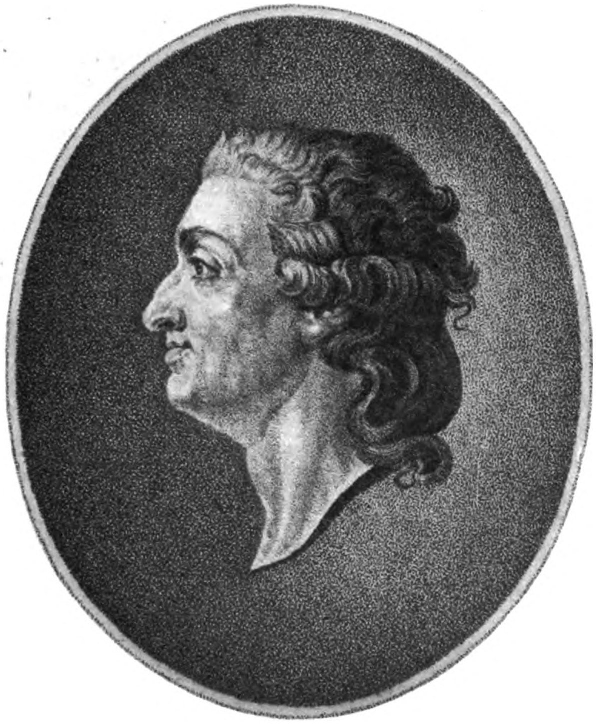
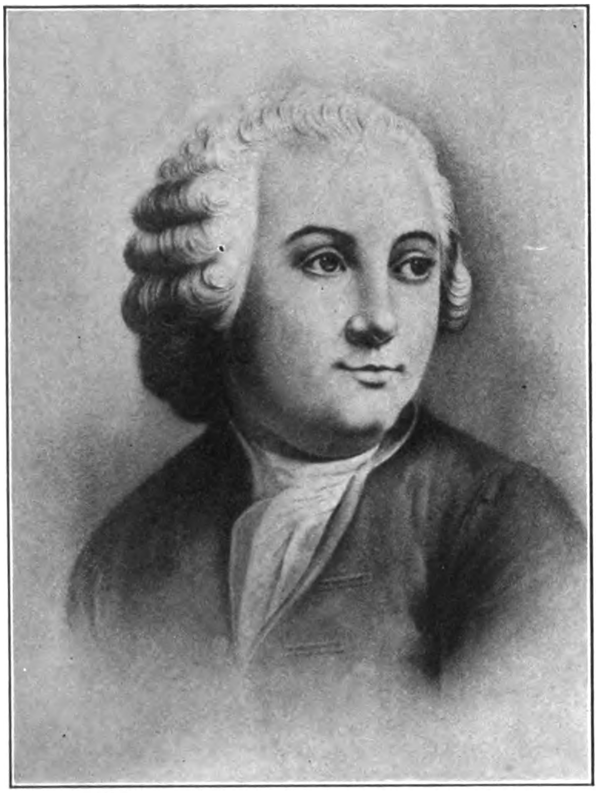
CONDORCET, MARIE JEAN ANTOINE NICOLAS CARITAT, MARQUISE DE (1743–1794). — Mathematician, philosopher, and politician. Born at Ribemont in France, and educated by the Jesuits. He early showed an aptitude for mathematics and science, and in 1769 he became a member of the Academy of Science, of which he became secretary in 1777. In 1782 he became a member of the French Academy. He was an active contributor to the *Encyclopédie.* In 1785 he published his most important mathematical work, *Elément du calcul des probabilités.* About this time he entered politics and became secretary, and later president, of the National Assembly. He was opposed to the Terrorists, by whom he was outlawed, and after remaining in concealment for some time he was caught and thrown into prison, where he died in 1794.

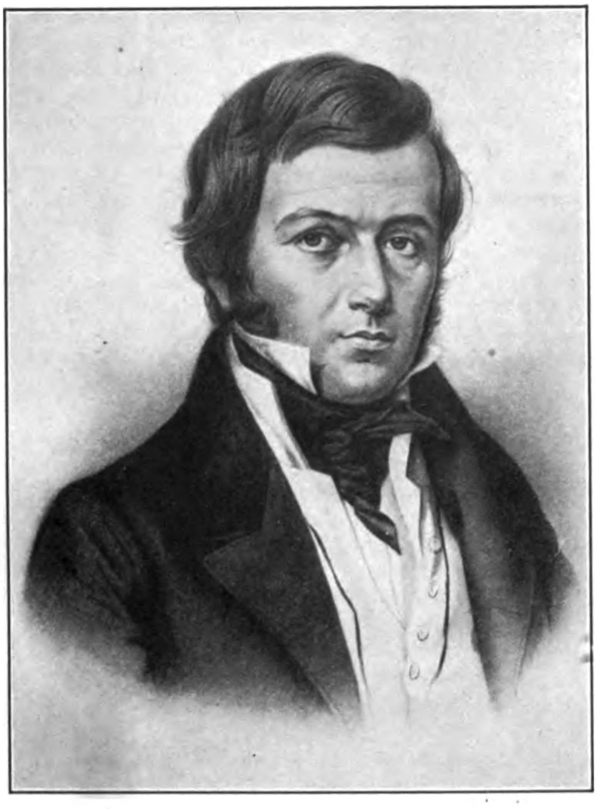
As member of the National Assembly he drew up a report on the state of education before 1789 and a project for a new system. The project is of considerable interest. He had already given expression to his educational ideas in *Bibliothèque de l'homme public,* which contained five memoirs: *Nature et objet de l'instruction publique; De l'instruction commune pour les enfants; Sur l'instruction commune pour les hommes; Sur l'instruction relative aux professions; Sur l'instruction relative aux sciences.* It is divided into two sections, one dealing with Condorcet's philosophy of education, the other with his practical proposals. Education, he held, was essential in a democracy; for ignorance would endanger liberty and equality and lead to anarchy and despotism. Every citizen should be entitled to sufficient education to make him intellectually independent of others. This should serve as a minimum. Not only is education necessary for liberty and equality, but it forms the basis of morality and human progress. The aim of life should be inspired by a belief in the perfectibility of man on earth rather than by hopes of immortality in a future existence. To the progress of humanity all should have the power to contribute. Hence instruction should be universal. Educational institutions should be devoted to the teaching of nothing but truth, hence they should be independent of all political authority and free from the interference of public bodies. The development of new truths should be permitted, even though these may be at variance with the political creed and interests of the time. Liberty of thought is one of the rights of man, and on it depends the social progress and perfection. No religious or political doctrine should be taught, but moral instruction should be given. But the State should bear the expenses of education, which should be free to all in all its stages. Not only should the male sex enjoy the privilege of education, but it should be open to girls and women, who should study side by side with boys and men not only the same curriculum, but in the same classes. The education of women is an essential preparation for motherhood, wifehood,



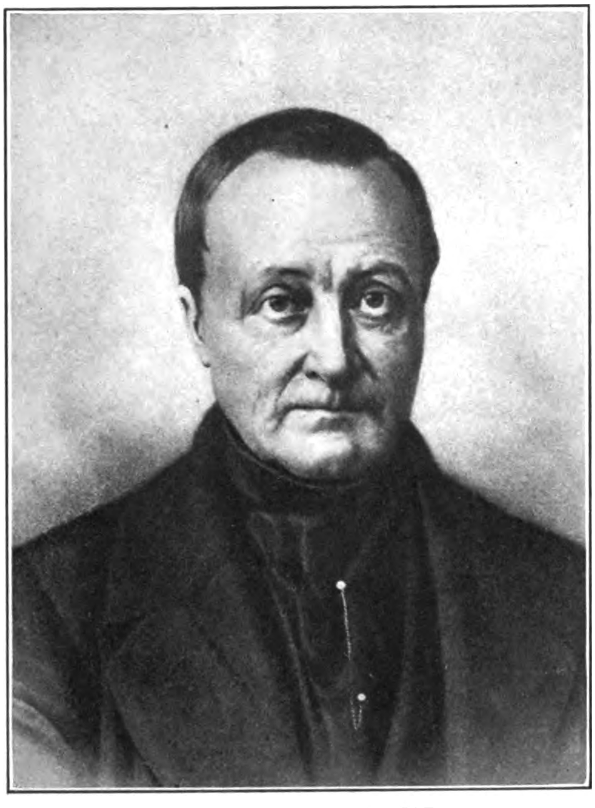
Marie Jean Antoine Nicolas Caritat, Marquis de Condorcet (1743–1794). See p. 174.



Étienne Bonnot de Condillac (1715–1780). See p. 174.



Victor Cousin (1792–1867). See p. 224.



Auguste Comte (1798–1857). See p. 169.

A Group of French Educators.

and comradeship of men. Condorcet was one of the first to suggest a departure from the traditional literary education and the inclusion of the sciences.

On the practical side Condorcet's proposals included elementary schools universally, higher elementary schools in districts and small towns, institutes or secondary schools, at least one in each department, lycées or colleges in large towns, and a National Society for Sciences and Arts. On the last the responsibility of supervision of the whole system was to devolve. The proposals of Condorcet were ordered to be printed, but in the political turmoil nothing came of them.

Into the philosophy of Condorcet it is not necessary to enter here. He was inspired throughout his life by his faith in human perfectibility, which he elaborated in *Esquisse d'un Tableau historique des progrès de l'esprit humain.*

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CONDUCT. — A general term for the spirit and tenor of all the overt acts that constitute the behavior of an agent. As contrasted with the term "behavior," the word "conduct" is usually limited to acts that have an end consciously in view and that are preceded by more or less deliberation — in short, to such acts as have moral quality, actual or potential. There has been much dispute among moralists as to whether conduct or character (*q.v.*) is the proper object of moral judgment. The intuitional school has always held that inner motive and disposition is the true subject of moral worth; while the utilitarians have contended that such considerations are of sentimental importance alone, and that the moral criterion must be sought in overt acts and their consequences, since these alone affect the welfare of society. The Stoics, Kant, T. H. Green, Martineau, represent the former view; Bentham, the Mills, Herbert Spencer, the latter. As in so many philosophic disputes, the controversy seems to arise from a false disjunction between the inner and the outer, the mental and the physical. Conduct is an expression of intention, and intentions are influenced by disposition, are, indeed, functions of character; since different types of character will, in the same situation, entertain different aims. On the other hand, a motive or good will that does not strive to express itself in overt action is unreal and hypocritical. In the course of discussion, each school makes concessions to the standpoint of the opposed school which go far to bridge the seeming gap between them, or to reduce it to a matter of emphasis. Certainly the educator cannot proceed on any other basis than that of the organic unity of conduct and character; he aims to modify disposition for the sake of influencing behavior, while it is only through the medium of overt acts that he has any approach to or leverage upon inner disposition. J. D.

See CHARACTER; MORAL EDUCATION.

CONFERENCES. — See TEACHERS, TRAINING OF, IN SERVICE.

CONFIRMATION. — See ADOLESCENCE; RELIGIOUS EDUCATION.

CONFLICT. — An important contribution to the working or dynamic logic of the human mind has been made in recognizing the part played in thought by conflict of stimuli, impulses, and habits. The antithetical character habit and attention has long been perceived; matters under habitual control tending to sink below explicit consciousness so that conscious attention is freed to deal with the novel and the difficult. By a further extension of the same principle it was recognized that wherever functions are performed with ease and adequacy and subject matter is harmoniously organized, there is no occasion or need for reflective thought. On the other hand, when responses (practical or intellectual) do not occur smoothly and effectively, thinking is required. Upon analysis, breaks and failures in responsive adjustment are found to be due to conflict of conditions or aims. When one stimulus tends to evoke one response, while another stimulus is acting in another and incomplete direction, or when inconsistent aims present themselves simultaneously, reflective thought is demanded in order to discover a new single stimulus which will coördinate the conflicting ones, or to project a comprehensive aim which will reconcile those opposing each other. The natural cue and occasion of thinking seems always to be found in some such situation. The lesson to be drawn as regards methods of teaching is obvious. The instructor stimulates thinking most successfully either by presenting the old or familiar under such conditions that unexpected discrepancies and incompatibilities appear in it, or by presenting the new in such a way that it both excites and resists assimilation by the old. Thinking is the natural consequence of such conflict — which, in more technical logical literature, is often called "tension." J. D.

See PROBLEM.

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CONFUCIANISM AND EDUCATION. — Confucius was born 551 B.C. His father — large, brave, and of great strength — was 70 years old when he married, so that, like Franklin, he was the child of his father's old age. He was a careful student of history, poetry, and human nature (but not a philosopher like Laotze and Chuangtzi), a lover of morals, with a strong ritualistic tendency, and a born teacher. He married at 19, but divorced his wife after she had borne him a son. He was appointed keeper of the stores of grain and guardian of the fields, but gave up official life at 22, and began his career as a teacher. At 28 he studied archery and music. At 30, or thereabout, he visited Laotze, the founder of Taoism, and after returning to his native place, he was surrounded by 3000 pupils, from which time he spent his life in imparting to them the rules of conduct and the principles of government. His descendants live to-day — the most renowned family in China.

Confucius has inspired the peoples of eastern Asia to a pursuit of the intellectual in the same way as Jesus Christ has inspired the peoples of western Europe to the pursuit of the spiritual, and has received from them the same kind of homage. His system of education, however, has been *memoriter*, has contributed to the development, for the most part, of only the reproductive faculties, and has done but little toward the development of the thinking powers — the reason and invention. It was of a moral and political nature, and in no way religious. He did not know men; how could he know God? He did not understand life; how could he understand death? These are the substance of some of his own statements. His highest hope was to develop a prince who would rule justly, and a people who would live righteously and obey implicitly the laws of the land. To this end he edited the *Books of Poetry, History, Changes, and Rites*, and wrote the *Spring and Autumn*. These have been made both the bible and the textbooks of all students from that time until the recent reforms of Kuang Hsü, which have started a new régime in China. They are called the *Five Classics*, and have been studied for twenty-three centuries by all Chinese boys, in their homes, or in private or governmental schools, under tutors or teachers, who have themselves passed or are preparing to enter the public examinations for preferment to official life. They are committed to memory so thoroughly that when the teacher gives a clue, the student can continue the sentence, — as much of a necessity in the learning of the language as in the understanding of the book, — after which they are explained by the instructor and the student studies the commentary.

During what may be called " the war for supremacy of the three religions " (200 to 700 A.D.), the " dark ages " of China, each cult erected schools or temples for the propagation of its tenets. The Confucianists decorated their schools with portraits of their great men, the Taoists and Buddhists with paintings of their gods. It was thus they developed Chinese art, and appealed to the people for support. The Taoists were the alchemists and so-called scientists, the Buddhists the religionists, while the Confucianists appealed to the intelligence of the people and their love of learning only, except as they forced upon them the worship of their ancestors. Confucianism contributed to the intellectual development of the people, and their establishment in morals, while Taoism and Buddhism were indifferent even to the education of their priests, and so Confucianism finally became the first of the three systems and the recognized conservator of Chinese education. I. T. H.

See CHINA, EDUCATION IN.

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CONGO, FRENCH. — See FRENCH COLONIES, EDUCATION IN.

CONGREGATIONAL COLLEGE OF CANADA, MONTREAL, CANADA. — An institution which arose in 1864 from the amalgamation of two older Congregational theological institutes in Montreal and Toronto. The present title was adopted in 1884. Since 1865 the college has been affiliated with McGill University. The original and still the primary purpose of the college was to prepare ministers for the denomination. Candidates are received on the recommendation of their pastors. The students take their literary courses usually at McGill and the theological at the College. Graduates in arts are given at the end of a three-year course and the completion of the requirements the degree of Bachelor of Divinity. There are five professors.

CONGREGATIONAL EDUCATION SOCIETY. — See COLLEGE BOARDS IN EDUCATION, DENOMINATIONAL.

CONGREGATIONS, TEACHING. — See CHRISTIAN BROTHERS; CONVENT SCHOOLS; PAROCHIAL SCHOOL SYSTEM; RELIGIOUS TEACHING ORDERS; JESUS, SOCIETY OF; URSULINES.

CONGRESSES, INTERNATIONAL. — See INTERNATIONAL CONGRESSES ON EDUCATION.

CONGRESSIONAL GRANTS. — See SCHOOL FUNDS; NATIONAL GOVERNMENT AND EDUCATION.

CONGRESSIONAL LIBRARY. — The Library of Congress, Washington, D.C., was established by act of Congress, Apr. 24, 1800. In 1870 it was made the federal copyright office, and in 1897, upon removal to a separate building, it was reorganized with a view to national as well as legislative service. The building of the Library of Congress, the largest and most splendid library building in the world, was completed in 1897 at a cost of $6,347,000. With recent additions to its book stacks it has a shelving capacity of about three million volumes and seats for about a thousand readers. The library budget for the year 1909–1910 was for salaries $369,171.83; for the purchase of books, $108,000; for care and maintenance of building, $137,205; total, $621,676.83. There is also an appropriation of $202,000 for printing and binding. Its printed books include the most complete collection of United States and foreign documents, national, state, and city, in this country; one of the largest collections of the publications of learned societies, — a collection accumulated largely by the Smithsonian Institution (*q.v.*); and one of the largest collections of newspapers, domestic and foreign. (A *check list of American newspapers*, 1901, 292 pp. *Check list of foreign newspapers*, 1904, 711 pp.) The collection of Americana includes, in addition to publications deposited in the library in compliance with the requirements of the copyright law, the library of President Jefferson, purchased in 1814 (*Catalogue of the Library of the United States*, 1815, 170 pp.) and the library of Peter Force, purchased in 1867. Among the more notable collections of foreign publications are the Yudin collection of Slavic literature, 80,000 volumes; a Japanese collection of about 9000 works; and the Huitfeldt-Kaas collection of Scandinavian books, 5000 volumes. The manuscript collections include the papers of Presidents Washington, Jefferson, Madison, Monroe, Jackson, Van Buren, Polk, Pierce, and Johnson; the papers of the Continental Congress; of Benjamin Franklin, Alexander Hamilton, Daniel Webster, and many other statesmen. Calendars of some of these have been published by the Department of State; others by the Library of Congress. The map collections are especially rich in maps of America, the Kohl collection, etc. (*List of geographical atlases*, 1909, 2 vols. *List of maps of America*, 1901, 1134 pp.) The print collections include the Hubbard collection (*Catalogue*, 1905, 517 pp.), and the Noyes collection, the latter confined to Japanese prints (*Catalogue*, 1906, 32 pp.). The Music Division, established in 1897, published in 1908 its first catalogue, a catalogue of full scores of dramatic music (170 pp.).

The collections numbered in 1909: Books, 1,702,685; maps and charts, 111,343; music (volumes and pieces), 501,293; prints (pieces), 303,036. The bibliographical service of the library consists chiefly in the publication of (1) unedited manuscripts in its possession; (2) a monthly catalogue of copyright entries of books and other articles deposited under the copyright law; (3) catalogue cards for all books acquired by action of the copyright law, by purchase or otherwise; (4) miscellaneous bibliographical publications.

The library is open from 9 A.M. to 10 P.M. on week days; and from 2 P.M. to 10 P.M. on Sundays. Inter-library loans are made in the interests of advanced research. W. D. J.

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CONGRUENCE. — A term used in modern mathematics to denote various relations. In particular, two numbers are said to be congruent with respect to a certain modulus when the remainders arising from dividing by this modulus are equal. This is expressed, for example, in this way: $17 \equiv 62$ (modulo 9), meaning that the remainders arising from dividing 17 and 62 by 9 are equal. The theory of congruences plays an important part in the general theory of numbers. The word is coming into use in the teaching of elementary geometry to mean "identically equal," that is, equal in all their parts. Thus, two triangles are congruent if two sides and the included angle of the one are respectively equal to the corresponding parts of the other. This use of the term avoids the lax employment of the word "equal," which has a variety of meanings, usually referring to numerical measure. The tendency in teaching elementary geometry at present is, therefore, to use "congruent" for "identically equal," and "equal" for "equivalent." When equality necessitates congruence, as in the case of two equal straight lines, the word "equal" is sufficient. D. E. S.

CONICS. — A name given to the three typical conic sections made by a plane cutting a cone of revolution. A cone of revolution is a solid formed by the revolution of a right triangle about one of the sides forming the right angle. Any position of the hypotenuse, as the triangle revolves, is called an element of the cone. More generally, a line that constantly passes through a fixed point (the vertex) and constantly touches a fixed curve (the directrix) generates a conic surface, part of which lies on one side of the vertex and part on the other, these two parts forming the two nappes of the cone. If a plane cuts a cone of revolution so as to intersect all of the elements on one side of the vertex, the conic section formed is an *ellipse*. If the plane is parallel to an element, the conic section formed is a *parabola*. If the plane cuts the elements on opposite sides of the vertex, the conic section formed is an *hyperbola*. These sections seem first to have been discovered by Menæchmus, a pupil of Eudoxus and a contemporary of Plato, and to have been used by him in the duplication of the cube. Eratosthenes speaks of them as the "triads of Menæchmus." The subject occupied the attention of several Greek writers. Aristæus the Elder (*c.* 320 B.C.) wrote a work on "solid loci," which was really a treatise on conics. In this he uses the names "sections of a right-angled, acute-angled, and obtuse-angled cone," which were the common names in use up to the time of Apollonius. Euclid (*q.v.*) also wrote a work on conics covering about the field of the first three books of Apollonius. Archimedes (*q.v.*) included a considerable treatment of conics in his works, notably *On Conoids and Spheroids*, but did not, so far as known, write a separate treatise on the subject. There are, however, a number of propositions known to be due to him, the best-known one being that relating to the area of a parabola: "Every segment bounded by a parabola and a chord is four-thirds of the triangle which has the same base and an equal altitude." The greatest of the ancient writers upon conics was Apollonius of Perga, in Pamphylia. He was born in the reign of Ptolemy Euergetes (247–222 B.C.) and studied at Alexandria. His work consisted of eight "books," of which only seven are extant, four in the original Greek and the rest in Arabic translations.

The treatment of conics by the ancients was purely geometric, like the treatment of plane geometry by Euclid. Apollonius knew and proved the most important propositions on the subject which we now treat by the methods of analytic geometry (*q.v.*). The invention of this latter theory (1637) opened a new era for conics, and from that time to the present the Greek methods have slowly given way to the analytic treatment. At the present time "geometric conics" are rarely studied except as an interesting part of the history of mathematics.

D. E. S.

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CONJUNCTIVITIS. — See EYE, HYGIENE OF.

CONNECTICUT COMMON SCHOOL JOURNAL. — See JOURNALS, EDUCATIONAL.

CONNECTICUT AGRICULTURAL COLLEGE, STORRS, CONN. — Established in 1881 by the Connecticut General Assembly to educate the sons of citizens of the state in scientific methods of agriculture. Since 1893, young women have been admitted. The college receives annual appropriations from the state and federal government under the acts providing for grants to such institutions. The college is under the control of a board of trustees of 11 members representing the state, the alumni, and Board of Agriculture. The Governor is a member of the board *ex officio.* Candidates for admission must be 15 years of age. Academic courses extending over two years and covering that period of high school work are given. Specialization begins in the third year, and extends over three years. Courses are provided in agriculture, mechanical arts, and home economics. The degree of bachelor of science is given on completion of a sixth year of work in agriculture. There are 13 professors, and 11 instructors and assistants.

See AGRICULTURAL EDUCATION.

CONNECTICUT, STATE OF. — One of the original thirteen states. It has a land area of only 4845 square miles, and only two states, Delaware and Rhode Island, are smaller. The state of New York is about ten times its size. In 1910 Connecticut had a population of 1,114,756, and a density of population of 230 persons per square mile. But three states had a greater density. For administrative purposes the state is divided into 8 counties, chiefly used for judicial purposes, and these are in turn divided into 168 towns. These towns correspond, in a general way, to a western township. In many of the towns the total population ranges from 500 to 800 inhabitants. The cities are sometimes conducted as a part of the town form of government, and sometimes they are independent districts which have been segregated from the town.

Educational History. — In the beginning two distinct colonies were established in Connecticut, — Connecticut colony (1635), with Hartford as its leading town, and New Haven colony (1638), with New Haven as its leading town. Schools of some kind were established some time after the arrival of the early colonists, each colony acting independently. The first code of laws of Connecticut colony (1650) required every town containing 50 families to "appoint one within their town to teach all such children as shall resort to him, to read and write," and every town of 100 families to "set up a grammar school, the masters thereof being able to instruct youths so far as they may be fitted for the university," and directed that the teachers should be paid either by the parents or masters of such children, or by the inhabitants in general. The New Haven colony code of 1655 made it the duty of parents and masters to teach children and apprentices to read. In 1665 the two colonies were united, and the Connecticut code became the law for the united colonies. In 1666 four counties were organized, — Hartford, New Haven, New London, and Fairfield, and in 1672 the grammar school requirement was changed to one such school in each country town, and 600 acres of land was granted to each county for the benefit of such a school. In 1678 the requirement for an elementary school was changed from 50 to 30 families. In

1690 the general court (legislature) granted £60 yearly to the grammar schools of New Haven and Hartford, and in 1693 each of the two remaining schools received £30. Despite these rather remarkable early laws and the watchfulness of the courts, many children were growing up in ignorance, and in 1690 it was made the duty of the grand jury to visit, at least once a year, each family suspected of evading the law, and parents or masters found guilty were to be fined 20*s*. for each neglected child or servant. In 1700 a town tax for schools was levied in the form of a law ordering that 40*s*. on the £1000 (2 mills), to be raised by additional taxation, be paid from the treasury of the colony to those towns which maintained their schools according to law, and in proportion to their respective tax lists and polls. Any deficiency in funds was to be made up from the income from school bequests, if any existed, and after that by the town and parents, in equal proportions, unless otherwise ordered. This law was changed to read 10*s*. in 1754; 20*s*. in 1766, and restored to 40*s*. in 1767, and then remained in force at that sum until 1820. In 1700 every town of 70 families was called upon to maintain a school for 11 months each year, and all smaller towns for 6 months. In 1712 these requirements were extended to all parishes, or societies, into which a number of towns had been divided for convenience in worship. The law of 1750 reënacted these provisions and codified all school laws then in force, and declared that the fund, derived from the sale of the school land in northwestern Connecticut in 1733, should be a perpetual fund for the support of schools in the different towns and societies.

In 1714 the first law relating to supervision was enacted. This directed the selectmen of each town " to inspect the state of all such schools as are appointed in said town, from time to time, and particularly once in each quarter of the year, . . . and to inquire into the qualifications of the masters of such schools and their diligence in attending to the service of said schools, together with the proficiency of the children under their care." This law remained in force until 1798, when each school society was required " to appoint a suitable number of persons, not exceeding nine, of competent skill and letters, to be overseers and visitors of schools," to whom was assigned the duty of examining teachers, approving their work, making rules and regulations for the schools, and directing the " instruction of youth in letters, religion, morals, and manners." In 1856, on the abolition of the school societies, the duty of appointing school visitors was given to the towns.

In 1733 the public lands belonging to the colony, lying in what is now the northwestern part of the state, were set apart to form a permanent school fund, the proceeds of these lands, certain reservations excepted, to be distributed among the different towns in proportion to their tax lists. All parishes and societies were to receive their due proportion, and on the same basis. The " school society funds," taken over by the towns on the abolition of the school societies in 1856, and now known as local funds, had their origin chiefly from the sale of these lands. The Connecticut School Fund (see under School Funds,), which for half a century was the main support of the schools, came from the sale of the so-called Western Reserve. The colonial charter of Connecticut granted to the colony a strip of land west to the Pacific Ocean. A portion of this was ceded to Pennsylvania, and the remainder, with the exception of a reserve 120 miles long in northeastern Ohio, was ceded to the United States. In 1795 this reserve was sold for $1,200,000, and this sum was set aside as a permanent school fund, the income to be distributed among the school societies in existence or to be formed, though by a two thirds vote the income might be used by the societies for the support of the Christian ministry or public worship. By careful management the fund was increased to over $2,000,000 by 1849, and it has remained at about this figure ever since. The first income was distributed to the societies in 1799, on the basis of the taxable property and polls, but since 1820 it has been distributed in proportion to the number of census children 4–16 years of age. The income now is worth only about 50 cents per census child. In 1836 the United States Surplus Revenue fund was distributed, Connecticut's share being $764,670.61. Of this amount one half was devoted to education and loaned out to the towns, and is locally known as the Town Deposit Fund. Much of it has been lost, and to-day remains only as a perpetual obligation, for which the towns tax themselves annually to pay the annual interest.

In 1766 the beginnings of the district system (*q.v.*) were made. Each town and parish was authorized to subdivide into districts of convenient size, and to maintain whatever number of schools seemed desirable. At first these districts were mere subdivisions of the towns, but in 1794 their separate existence was recognized by a law which enabled them to locate schoolhouses, levy taxes, and appoint collectors. In 1799 they were permitted to choose clerks and treasurers, and in 1839 they were recognized as bodies corporate and were authorized to elect their own committees. In 1795, 1798, and 1799 laws were passed by which parishes or societies were similarly invested with full control over schools within their limits, and were designated by the new name of " school societies." In 1856 an effort was made to undo this action and to return to the town basis. In this year the " school societies " were abolished, and their powers and duties were transferred to the towns. In 1865 towns were authorized to consolidate all of their districts under town management, by a majority district vote, and in 1866 the towns were permitted to consolidate by vote of the town as a whole. A little over one half of the towns had voluntarily abandoned the district system by 1909, when on the recommendation of a special educational commission it was entirely abolished by law.

The law of 1795 with regard to the school fund, and the law of 1798 appointing school visitors and establishing supervision, practically revolutionized the system. The old county grammar school law of 1672 was repealed, though permission to form schools of higher grade than elementary was given. The new school fund soon produced so large an income, that, in 1820, a law was passed relieving the towns of the necessity of longer levying the tax, first required in 1700, as soon as the income from the school fund reached $62,000. This came to pass in 1821, and from that date until 1839, when a district tax for current expenses was permitted, and until 1854, when the town tax was restored, the chief reliance of the districts for funds was the income from the school fund and assessments. The latter were authorized in 1810, and were levied on each head of a family in proportion to the number of pupils sent to school and the number of days attended by each.

The constitution adopted in 1818, superseding the colonial charter of 1662, contained only a short section on education. The charter of Yale College was confirmed, and the school fund was fixed as a sacred fund and set apart for the support of education alone. Beyond this the constitution was silent, and no mandate or direction as to schools was included. This provision has remained unchanged to the present time, and the progress which Connecticut has made in education since 1818 has been the result of good leadership and public sentiment, and not in response to constitutional requirements. The time of the adoption of the Connecticut constitution was a period of apathy in education in all New England; the large and increasing income from the Connecticut school fund was producing carelessness; private schools were on the increase; the schools of the school societies were poor; the pauper school idea had found favor in a number of states; and a general decline in educational interest had set in. This state of affairs continued well into the forties. In 1838 an investigation was ordered. In 1839 a Board of Commissioners for common schools was established. They were authorized to appoint a secretary who should "devote his whole time, if required, under the direction of the Board, to ascertain the condition, increase the interest, and promote the usefulness of the common schools." Henry Barnard (*q.v.*) was elected secretary, but in 1842 the legislature abolished both the board and the office. In 1845 the commissioner of the school fund, an official created in 1810, was appointed Superintendent of Common Schools by the general assembly. In 1849 the first state normal school was established, and the principal of the school was made *ex officio* Superintendent of Common Schools. This put Henry Barnard back into office, a position which he continued to hold for the next six years. In 1865 the State Board of Education was created and required to elect a secretary, and this form of state supervision has continued ever since. Since 1850 the progress of the schools of Connecticut has been steady and marked. In 1854 an obligatory town tax of 1 cent on the $100 for schools was established; in 1856 the "school societies" were abolished; in 1865 towns were permitted to return to the town system; in 1868 the town tax was ordered increased sufficiently to make the schools free, thus abolishing the rate bill; in 1871 the first state appropriation of 50 cents on census was made to the towns for schools, in 1872 the sum was raised to $1.50, and since then it has been raised to $2.25; in 1882 a compulsory education law was enacted; in 1884 state examinations for general state teachers' certificates were instituted; in 1885 evening schools were provided for; in 1886 the establishment of kindergartens was permitted, and laws regulating the employment of children were enacted; in 1886 town supervision, and in 1903 the consolidation of towns to form supervisory unions, with state aid for the salary of the superintendent, were permitted and provided for; in 1888 private schools were required to report to the state; in 1897 state aid was granted toward the payment of high school tuition fees for pupils from towns where no high school is maintained, and in 1903 state aid toward the payment of the transportation of such pupils was granted; in 1903 important legislation was enacted whereby the tax rate in poor towns is equalized down to 4 mills and the advantages of education are equalized up to $25 per pupil in average daily attendance; in 1909 this was changed to a graded system whereby the aid was granted to a large range of towns; and in 1907 important state aid was granted to assist in the establishment of good trade schools.

Present School System. — The present school system of Connecticut is organized as follows: At the head of the system is a State Board of Education, composed of the Governor, Lieutenant-Governor, and Secretary of the Board, as *ex officio* members, and four others, appointed by the general assembly for four-year terms, one going out of office each year. Members are eligible for reappointment, but must be elected one from each congressional district of the state. This board appoints the Secretary and fixes his compensation, and the Secretary acts as the executive officer of the board, and virtually as a Superintendent of Public Instruction for the state. The State Board of Education has general supervision and control of the educational interests of the state; may designate textbooks for use in the schools; prepares all blanks and school registers; may examine teachers under such plan as it may deem best, and may grant certificates valid in the entire state; prepares means for making eyesight tests and furnishes the same to the schools of the state; may appoint a special agent to see that the laws relating to instruction are enforced; is charged with the duty of enforcing the child labor laws, and may appoint state agents to see to their enforcement; must hold meetings of teachers and school officers annually; acts as a trustee for and has complete charge of the four normal schools of the state; approves the course of instruction, buildings, and equipment, and the teachers in all trade schools receiving state aid; and must make an annual report to the Governor.

The counties of Connecticut have no educational function other than the maintenance of temporary home schools for dependent children, which are established and controlled by the county commissioners, and subject to inspection by the State Board of Education. There are no county boards of education, county superintendents, county teachers' examinations or certificates, or county school tax. The next administrative unit for schools below the state is the town, or independent district. All towns are required to maintain thirty-six weeks of school in all schools, under penalty of forfeiting all state aid. Every town having any local school fund must annually elect a treasurer to look after it, and towns having a town deposit fund must elect an agent to loan it out and care for it. Schools must be open to all children over five years of age, and may be thrown open to all over four years. Kindergartens may be established in any town, and may be open to all over three. Any town at its annual meeting may vote to provide free text books for all its school children, and, on petition of twenty voters, must submit the question to an election. Women may vote on school questions, and are eligible for school offices. If the town contains 10,000 or more inhabitants, it must, and smaller towns may, provide evening schools for the instruction of those over fourteen years of age. Evening schools must be maintained seventy-five evenings each year. Towns that neglect or refuse to provide proper school facilities forfeit to the state an amount equal to that which should have been raised. Any town may vote to establish a trade school for the instruction of those over sixteen years of age, or may unite with other towns for this purpose. Any town may employ a superintendent of schools, or unite with other towns for the purpose, the state paying half of the superintendent's salary. If a town has less than twenty teachers, which is the case in more than two thirds of the towns, it may petition the State Board of Education for a superintendent, and this board will then designate an agent (superintendent), who supervises the schools and reports to the State Board of Education. The State Board will also pay three fourths of his salary. Every town must see that its schoolhouses are kept clean and in a sanitary condition; may appoint a school physician to examine teachers, janitors, buildings, and children, and to serve as medical inspector; and may appoint a matron or nurse.

The schools of the town are operated as a unit by the town school committee, consisting of three, six, nine, or twelve members, as the selectmen of the town may determine. They are elected by ballot in the annual town meeting, and one third go out of office each year. If the town has formerly been managed under the district system, the town school committee succeeds to all the functions of the various district committees, board of school visitors, and high school committees, which it supersedes. This town school committee maintains as many schools as it deems necessary in the different parts of the town; may close small schools, and provide transportation to other schools instead; manages the school property; examines, employs, pays, and dismisses teachers; determines the number and the qualifications of the pupils to be admitted to the different schools, and determines the school boundary lines; may elect a town superintendent of schools, and fix his salary; compiles, or has compiled, an annual school census of all children four to sixteen years of age, by ages and by school attendance; determines each year, in conjunction with the selectmen of the town, the amount of money necessary to maintain the schools during the ensuing year; compiles an annual financial statement and report, and submits a copy to the annual town meeting; and has control of the high schools of the town.

Certain cities, originally districts of the towns, have been organized as special districts. Fourteen districts or towns have been organized under special laws, in which the school affairs are under the control of a board of education, possessing the powers of a town school committee with certain additional powers granted to it under the special law of organization. (See special articles on HARTFORD, and NEW HAVEN, as examples of such special city districts.)

School Support. — Most of the money expended on schools in Connecticut comes from local sources. The last report of the Secretary of the State Board gives the following summary of receipts: —

Income on State School Fund . .	2.88 per cent
Income on Town Deposit Fund . .	.69 per cent
Income on local permanent funds .	.22 per cent
Income from state taxes for schools	1.08 per cent
Income from town taxes	60.21 per cent
Income from district taxes . . .	19.51 per cent
Income from voluntary contributions	1.08 per cent
Income from tuition fees	.98 per cent
Income from other sources . . .	3.62 per cent
Income from state grants for attendance, evening schools, libraries, supervision and administration . .	9.73 per cent

The state gives to each town $2.25 direct for every child four to sixteen years of age on the census rolls; $2.25 per pupil in average attendance seventy-five evenings in evening schools; pays two thirds (up to $30) of the tuition fees of high school pupils from towns where no high school is maintained, and one half (up to $20) of the annual transportation expenses for attending; pays one half (maximum grant, $800) of the salary of town superintendents of schools in supervisory unions, and three fourths of the salary of an agent (superintendent) appointed by the State Board of Education to towns having less than twenty teachers; pays a grant of $5 per year per 100 pupils to schools for a school library, provided they raise a similar amount for the same purpose; and grants $50,000 per year to towns (limited at present to two) to help in maintaining a town trade school, the town being required to duplicate the amount given. Since 1903 the state has also granted extra aid to any town applying for it which has a valuation of less than half a million dollars. In 1907 this was extended to towns having a valuation of less than one million, and in 1909 to towns having a valuation up to one and three quarter millions. Such aid is granted on application to such eligible towns as collect and expend for schools for maintenance only the following amounts: If not over $500,000 valuation, a tax of three mills; if over $500,000 and less than $1,000,000, a tax of three and one half mills; if over $1,000,000 and less than $1,250,000, a tax of four mills; if over $1,250,000 and less than $1,750,000, a tax of six mills. The amount so granted is such as will enable the town to expend $25 per year per pupil in average daily attendance, the grant to be used for teachers' wages only. This grant, on the average, paid 60 per cent of the teachers' wages in the aided towns, and enabled such towns to pay $38 to $40 a month to their teachers. Only about three fifths of the eligible towns had availed themselves of the grant by 1906. The remainder of the school money, aside from the income from permanent funds, comes from taxes levied by the town school committee, acting in conjunction with the selectmen of the towns. Any amount expended in excess of their estimates must be raised in the districts.

The total expenditure for education in Connecticut during the last year for which statistics are available was $4,968,700. Based on the total population of the states, this was equal to a per capita expenditure of $4.79 a year. In expenditure for schools the state stands somewhat above the average for the United States as a whole, but below that of any adjoining state. The average expenditure per pupil per day was 19.1 cents, as compared with 20.2 cents in Rhode Island, 22.94 cents in Massachusetts, and 26.94 cents in New York. In amount raised per child five to eighteen years of age ($21.15); in amount raised per adult male ($15.74); or on the expenditure for schools on the $100 of wealth (25.8 cents at last report); Connecticut occupies about the same relative position. In most items of expenditure Connecticut expends about the same amount as the states of the North Central Division, but due to its much greater density of population and much smaller percentage of children of school age (22.9 per cent as against 28.2 per cent for the North Central Division), Connecticut should be able to do much more each year with the money it has than the North Central states are able to do. In increase of school expenditure during the past thirty years, Connecticut has been outstripped by its neighbors.

Educational Conditions. — Connecticut has long been noted for its vigilance in the matter of the attendance of its pupils at school, and in the protection of its children. The school attendance and child labor laws, and the enforcement of them, are among the best in the Union. All children seven to sixteen years of age must attend schools while they are in session; children over fourteen years of age may be excused from attendance, if their education is satisfactory, and if they are at work; no child under fourteen can be employed in any mechanical, mercantile, or manufacturing establishment at all, and no child under sixteen unless provided with a proper certificate. Employers must keep age and schooling certificates on file; agents are appointed to enforce the law; and heavy fines are imposed for violations. Each town is also charged with the duty of enforcing these laws. The school term required is long (nine months), and the average number of days attended by each pupil enrolled (141.2 days) is only exceeded by three other states, all being in the North Atlantic group. Massachusetts was highest, with 154 days, while the average for the United States as a whole was but 109.8 days. In the percentage of average daily attendance based on the number enrolled, Connecticut, with 76.5 per cent, was exceeded by nine other states only, Massachusetts again being highest, with 81.9 per cent.

Only five states, two of them in the West, with a high percentage of men, have less children five to eighteen years of age in the total population than has Connecticut, with 22.9 per cent. Nevada is lowest, with 21.3 per cent; South Carolina is highest, with 34.6 per cent; while the average for the United States as a whole is 28.3 per cent. In illiteracy, 5.9 per cent of the total population ten years of age or over was illiterate in 1900, but this large illiteracy is confined almost entirely to the foreign-born element in the population (26.6 per cent of the total), which has crowded into the cities and manufacturing towns within recent years. In an effort to cut down and keep down this illiteracy, school attendance has been rigidly insisted on, and to enforce the attendance laws better all private schools have been required, since 1888, to keep a state school register and to report full statistics on all items except finance to the public school authorities. Attendance at private schools is enforced on the same basis as attendance at public schools. Of the total enrollment in all schools in 1908, 17 per cent were enrolled in private schools, and 12.5 per cent in parochial schools. The parochial schools, nearly all Catholic, are well organized, and enroll a large proportion of the children in the manufacturing towns, and in towns having a large foreign population.

The large towns and cities are well equipped with good school buildings and teaching appliances, have good teachers, pay good salaries, and have excellent schools. This they are able to do with ease and on a low tax rate, because of their greater wealth and density of population, and because of the long-established state policy of requiring that the school system be supported largely by local taxation. On the other hand, the schools in many of the smaller and poorer towns are badly supplied with buildings or teaching equipment, pay small wages, have untrained teachers, and maintain inefficient schools, because, under a system of local support, the best that they can provide is inadequate to meet present-day needs. Of the teachers of the state, 2.5 per cent are still paid less than $25 per month. The rural schoolhouses have been greatly improved within recent years, especially from a sanitary point of view, but many still leave much to be desired, and about two thirds of the school buildings and about one eighth of the teachers belong to the single-room district school class.

Kindergartens are maintained by 32 towns, 31 towns maintain evening schools for those over 14 years of age, and 9 towns or districts offer instruction in manual training. After forty years of granting small subsidies, but little has been done toward building up school libraries, as not more than 112 out of 168 towns report schools as having school libraries, and the 914 school libraries in 1908 averaged only twenty-five volumes to the library. The state, on the other hand, is well supplied with public libraries, which are under the supervision of a State Library Commission of five, appointed by the State Board of Education to travel about, give advice, and assist the public libraries of the state. Each public library receives $100 a year aid from the state for books approved by the Library Commission, provided the library raises a similar sum.

Teachers and Training. — The state certification plan, by which the State Board of Education gives examinations and grants certificates, valid in any town or district in the state, has made headway slowly since its inauguration in 1884, but so far only about 25 per cent of the 5025 teachers employed in the state hold state certificates. The remainder of the teachers secured their certificates from the local authorities. Boards of education in cities, and town school committees in the towns, or committees appointed by them, are authorized to examine all applicants as to their moral character, and in reading, writing, arithmetic, and grammar, and in the rudiments of geography, history, and drawing. If the candidate is to teach above the third grade, the examination must include temperance, physiology, and hygiene. Certificates valid to teach in the town are granted to teachers meeting this test, which is not generally administered in a severe manner, though the certificate may be limited in time and to a particular district, or school, if the examining authorities so decide. The state examinations are much more rigidly conducted, and the certificates granted represent a much higher standard than most town certificates. The State Board grants certificates on examination, as follows: (1) statutory certificates, on the statutory school subjects, and strictly limited in time and to a particular town; (2) elementary certificates of two grades, based on an examination in additional subjects, and valid in any school in the state; (3) certificates of special preparation, of two grades; (4) kindergarten certificates, of two grades; (5) supervisory certificates, of two grades. Evidence of education and preparation is required in advance of the examination, and may be accepted in lieu of certain parts of it. No provision exists as yet for the certification of normal or college graduates on credentials, or for the recognition of teachers' certificates from other states.

The State Board of Education maintains four state normal schools for the preparation of teachers, located at Danbury, New Britain, New Haven, and Willimantic, and the city of Bridgeport maintains a city normal school. About 45 per cent of the teachers of the state have attended some normal school, but the normal graduates are located almost entirely in the cities. For the improvement of those in service the state appropriates $3000 each year to enable the State Board of Education to hold teachers' meetings at various points in the state.

Secondary Education. — Public high schools were maintained in sixty-one towns and eighteen districts. Besides these, eighty-three additional towns provide for their high school pupils in adjoining towns, and sixty-seven of the eighty-three provide transportation for the pupils in addition. The State Board has approved five private academies for the attendance of nonresident pupils from towns not maintaining high schools, something which would not be permissible in most states. Any town may establish a high school, build a building, and levy a high school tax, but as one third of the towns have less than nine, and one half of the towns have less than thirteen teachers employed, a high school in every town is obviously unnecessary. Towns not maintaining high schools, but which agree to pay the tuition fees of their high school pupils in the high school or academy of some neighboring town, as well as the expenses of transportation incident to such attendance, both of which are still optional with the town, will be reimbursed for two thirds of the tuition and one half of the transportation paid, up to a maximum state grant of $30 for tuition and $20 for transportation per pupil per year.

Evening high schools are maintained by thirty-one towns for the instruction of those over fourteen years of age, and the state has recently (1907) agreed to pay one half of the expense, with a maximum grant of not over $25,000 a year each for not over two schools, of maintaining an efficient town trade school for the education of those over sixteen years of age, who have completed the eighth grade of the public schools. Buildings, equipment, course of study, and qualifications of the teachers are in such cases to be approved by the State Board of Education.

Higher and Special Education. — There is no state university maintained by the state. The Connecticut Agricultural College at Storrs (*q.v.*), opened in 1881, is a land-grant college offering instruction in agriculture and domestic science to a small student body, to which the state makes but a small appropriation for support ($20,000 in 1907–1908). The state maintains the Connecticut (industrial) School for Boys, at Meriden; and the Industrial School for Girls, at Middletown, both of which are reformatory institutions. The state also maintains the Connecticut Institute for the Blind, at Hartford; the American School for the Deaf, at Hartford; and the Oral School for the Deaf, at Mystic.

Yale University (*q.v.*) at New Haven, opened in 1701; Trinity College (*q.v.*) at Hartford, opened in 1824; and Wesleyan University (*q.v.*) at Middletown, opened in 1831, are three nonsectarian institutions of higher learning, for men only, maintained by private funds within the state. There are no institutions of higher learning in the state which are open to women, except the State Agricultural College, which offers courses only in agricultural and household economy. In 1911 Morton P. Plant gave $1,000,000 to found the Connecticut College for Women to be located at New London. E. P. C.

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CONNOTATION. — See MEANING; TERMS.

CONSCIENCE CLAUSE. — A provision inserted in the English Education Act of 1870 to safeguard the religious beliefs of children attending public elementary schools. The clause by the Education Act of 1902 was made applicable to all institutions receiving state grants. In schools provided out of public rates the Cowper Temple Clause (*q.v.*) applies. The Conscience Clause of 1870 runs as follows: "It shall not be required, as a condition of any child being admitted into or continuing in the school, that he shall attend or abstain from attending any Sunday School, or any place of religious worship, or that he shall attend any religious observance or any instruction in religious subjects in the school or elsewhere, from which observance or instruction he may be withdrawn by his parent, or that he shall, if withdrawn by his parent, attend the school on any day exclusively set apart for religious observance by the religious body to which his parent belongs."

See BIBLE IN THE SCHOOLS; ENGLAND, EDUCATION IN; RELIGIOUS EDUCATION.

CONSCIOUSNESS. — A general term intended to include all the mental states of an individual. Our experiences from moment to moment, such as sensations and ideas, thoughts and feelings, perceptions and volitions, comprise the facts of consciousness. Its particular characteristics and varieties, with the conditions, both physical and mental, which determine their appearance, modification, and disappearance, constitute the topics of psychology. What it is to be in a state of consciousness can be told, not by definition, but by description. "What we are when we are awake, and what we are not when we fall into a quiet dreamless sleep; what we are when we go about our daily work, and what we are not when an overpowering blow upon the head is received, — that it is 'to be conscious'" (Ladd). This "vague and treacherous word 'consciousness'" (Ward) has given rise to much debate in the history of psychology. Etymologically it refers to intellectual activity, and an early meaning interpreted it as designating the particular power by which the mind knows its own states or processes, or as the faculty which causes the mind to come to self-knowledge. At times even it has been used to specify a real entity.

The most striking and significant traits of consciousness, particularly that of man, are its increasing complexity and its development, whether regarded in the individual or in the race. The presence of these characteristics leads one to understand why a scientific study of mental facts requires the consistent maintenance of both a cross-sectional, analytic point of view (as in descriptive psychology), and a longitudinal or functional point of view (as in genetic psychology). Both standpoints are necessary in order to prevent an oversight of important facts and a neglect of their later significance in the modification of experience.

Consciousness may be studied in its entirety and as a unit (as, *e.g.* James, Ladd, Morgan), or it may be approached through an analysis of its processes and their functions (as, *e.g.* Angell, Judd, Thorndike). By the former mode, it is discovered to be a "stream," made up of a succession of "conscious fields," which differ in extent, intensity, or vividness, predominant quality, rate of movement, and is always marked by an exercise of a selective activity and by a tendency to become "personal," yet breaking up into parts such as "focal" and "marginal," or "substantive" and "transitive." By the other mode of approach, we have brought to our attention the different kinds of mental facts, their leading qualities and significances being exhibited in the various classifications proposed: such as, the activities of knowing, feeling, willing (Ward): sensation factors, relations between sensations, attitudes, memory contributions to experience, and ideational relations (Judd); or, mental states which are what they stand for, those which are like what they stand for, and those which are unlike what they stand for (Thorndike).

Inasmuch as consciousness always tends to serve certain ends, and is interested more in the results than in the processes of actions, the functional point of view has recently come forward, placing emphasis upon the contribution made by the mind in the adjustment of the organism to its environment. When sufficient facts have been gathered under the direction of this principle, which is showing itself applicable to animal as well as to human consciousness, there will be at hand as a distinct result a phylogenetic picture of the evolution of consciousness as it makes its manifestations in the upward scale of zoölogical life.

The dependence of changes in consciousness in man upon physical and neural conditions, such as external stimulations, blood supply, fatigue and rest, etc., as well as upon the specific activities of more or less definite organs or areas in the nervous system, has been clearly set forth in the numerous studies in physiological psychology.

It is most important to observe that education as a process must always be regarded in terms of consciousness. This is the single channel through which all teaching and non-teaching educative agencies can make their appeal to the individual. All sensory discriminations, useful images, formation of judgments, purposeful direction of movements, and every other occurrence required in the course of training and instruction must appear in the mind of the given person before education can be said to take place. An orderly control over the initial sequences of the conscious experiences of the child after its mental development has gone far enough to differentiate its chief processes, constitutes the fine art of teaching. Consciousness unifies capacities and actions by "dislocating experiences" (Minot) from their original setting and putting them into new relations which come to have directive significance for later interests and actions. When pupils are aware of the results desired, teachers realize that their efforts increase in efficiency. The different forms of learning are constantly dependent upon the presence of some conscious activity which leads the way to the next important thing to be done. The elimination of useless movements, in which all learning may be said to consist, finds its most favorable condition to be in a discrimination of those factors which are essential as contrasted with those which are unessential to the end to be attained. The services which consciousness seems to have performed in the indefinitely long series of organic changes called evolution, as well as the extraordinary development it has attained in man, alike indicate something of its supreme importance both as a means and as an end in human education. That there are certain mechanical and physiological stages set up through some conscious processes slipping into the background as experiences move forward (acquired reflexes, habits, association), shows still more conclusively the central position which consciousness occupies in education.

E.F.B.

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CONSCIOUSNESS, CRITERIA OF. — See Animal Psychology.

CONSOLIDATION OF SCHOOLS. — Fifty years ago there was no country school problem. The country school and the city school were much alike. Each had small, cheap buildings, poor equipment, and practically no teaching apparatus. Each drew its teachers from the same source and paid them about the same salaries. Trained teachers, skilled supervision, teaching equipment, special instruction, an enriched curriculum, these and other things with which we are now so familiar were practically unknown in city and country. But fifty years have seen great changes in American education, and in these changes the country school has been left far behind. The concentration of wealth has made it possible and the concentration of people has made it necessary that the cities should develop a class of schools capable of meeting the changed conditions of our life. They have provided more liberally for their schools, have drawn the best teachers to them, have developed high schools and supervision, have organized kindergartens, have provided laboratory and other teaching equipment, have added manual training, cooking, drawing, music, and nature study, and have done many other things which have made city schools attractive to parents who are solicitous for the education of their children. The smaller cities have made similar progress, and even the small village has a graded school and often a high school, good teachers, a system of supervision, teaching equipment, a course of study which includes some of the special branches, and a social spirit pervading the school which is of fine quality and of the first importance in the education of children.

The country school, on the contrary, has made little progress beyond where it was a generation ago. In many states it has been graded, to be sure, and uniform textbooks and a uniform course of study introduced, but these have usually added to the burdens of the teacher. The schools have been graded and the uniform examinations introduced as a test of efficiency, but this has too often served as a temptation to the teacher to neglect the younger pupils for the older ones who are to pass. Whenever the number of pupils has risen sufficiently high to make possible the employment of two teachers, the desire to have "a school close at home" has led to the division of the district. With the better preparation of teachers, in general, the quality of the country teaching has been improved, but even the best of teachers can make but little headway against such odds, and they leave at the first opportunity. The country school is poor, often miserably poor, compared with a good town school. This is chiefly due to its numerous classes, overburdened program, lack of equipment, and, above all, to its isolation and lack of that stimulus that comes only from numbers. The attendance is small, the children come from the same locality and have the same interests, and a majority are from related families. They bring no new interests to the school, there is little impulse to activity, and the school suffers from this lack of new ideas and impulse to action. Under present conditions the country school realizes but a small percentage of its possible efficiency, and many parents leave the farm and move to the town or the city, for the life of which they are not fitted, in order to give their children the advantages of a good education.

In regions where the population is sufficiently numerous, the remedy for this condition of affairs lies in the concentration of a number of these small, scattered, inefficient rural schools into a union consolidated school of two, three, or four rooms; in the provision of a good corps of teachers; and then in the transportation of the children from their homes to the school in the morning, and back to their homes in the evening, paying the expense of such transportation out of the school funds. This is what is known as consolidation of schools, and the transportation of pupils. The plan, in brief, is as follows: Two, three, four, five, or more existing school districts, each maintaining a small, inefficient rural school, vote to unite their schools to form a union school or are consolidated by some central authority. A three or four-room schoolhouse, built on modern lines and well heated, lighted, and ventilated, is erected at a central location. Arrangements are made for the daily transportation of all pupils living at a distance. One of the teachers is usually a person of some experience, often a man, and is designated as principal. Often three or four of these union schools unite again in the employment of a supervising principal and sometimes of teachers of special branches, each of whom devotes such time to each of the union schools as is agreed upon or as is necessary, and is paid in proportion by the different unions. In a number of places where this plan has been tried, the stimulus to better schools has been so great that the same unions have united to form a high school, thus providing a city school system in the country, consisting of a high school, graded elementary schools, superintendent, principals, teachers, and janitors. Instead of a city in compact form, it is a city spread out. Coöperation of communities for greater effectiveness is the central principle, and the advantages are those which come from organized coöperation. The new element which makes this coöperation possible is transportation, — the carrying of the child to the school. This is only an old idea in a new form. For seventy-five years we have maintained that it was the duty of the state to provide each child with the opportunity to secure an education. In carrying out this idea we have carried the school to the child. This has led to the division of districts and the multiplication of small schools. These have been found to be expensive and inefficient. The new plan merely proposes to reverse the process and to carry the child to the school, — even more, to carry the child some distance to a much better school than he now has near at home.

The consolidation of rural schools and the formation of unions naturally cannot take place everywhere. Schools in mountainous districts, or where the roads are impassable, or where population is sparse, cannot well be consolidated. These will have to remain about as they are for some time, — probably for a long time to come. But in the better settled regions there are certain natural concentrating centers, where unions could be formed with advantage, and in these places such unions should be formed as soon as the prejudices and the conservatism of communities can be overcome. Such a plan naturally possesses certain advantages, and also certain real or imaginary disadvantages. These may be stated, as follows, enumerating first the advantages, and then the disadvantages. The first and most important advantage is that such concentration means better schools. Fewer teachers will be needed, but better ones will be demanded and retained. The union school, with its graded rooms, will be such as to offer inducements to good teachers. Owing to the larger number of pupils in each grade, there will be present in the recitation work that stimulus which comes only from numbers. Owing to the larger number of pupils in the school as a whole and the new interests which this larger number will bring, there will be a social spirit present on the playground and in the school which will contribute greatly to the value of the education given. As a result of the presence of more than one teacher in the school, there will be developed a professional enthusiasm unknown in the isolated school. A second advantage will be a partial equalization of opportunities and advantages as between the boy in the city and the boy in the country, by bringing a school equal to a well-organized city school, with its many advantages, within reach of the boy on the farm. A third advantage is that such a combination of schools for greater effectiveness is also cheaper, though this cannot be made the chief reason for consolidation. The experience of states where the plan has been put into operation is that, in general, a better quality of education and a longer term of school, as well as transportation, can be provided at no greater expense than the aggregate cost of maintenance of a number of separate inefficient schools. In many unions a decided saving has been made, even after providing a better school and additional educational advantages. Another marked advantage of the plan is the greatly increased interest taken in the school by the people of the union district, after the school has once been established. The larger and better school develops a broader and a better educational spirit. More interest is taken in the larger school, better men are selected as trustees, better teachers are employed, a longer term of school is usually provided, school attendance is improved, the teaching equipment is increased, and the attitude of the community toward the school is changed. The school becomes a matter of pride instead of a matter of indifference to the community. The testimony on this point is universal.

In localities where the plan has not been tried it is often bitterly opposed, while in localities where the plan has been given a fair trial the people are strong in its support. In Massachusetts, Connecticut, Ohio, and Indiana, the most vigorous opponents of the plan, at the time of its introduction, were later among its strongest supporters. The objections usually advanced to the plan by those who have not tried it, include these: It is claimed that it is impractical, but the experience of a dozen states disproves this. Some parents object to sending children " so far away from home," but, so long as the child is well cared for, the difference between one mile and five miles is negligible. Five miles with transportation is really nearer than one mile of walking. The ride is objected to by some, but it is better to take the child from his door and deliver him at the schoolhouse in the morning, safe, warm, and dry, and return him to his home each evening, than that he should walk even half a mile and miss school whenever the weather is bad. The argument that the country boy needs exercise is no argument, as he has more than enough exercise at home. A common argument against the plan is that the removal of the little local schoolhouse causes a depreciation in farm property in the immediate neighborhood, with a corresponding increase at the concentrating center. This appeals at once to local jealousy and to the pocketbook, and is an idea that is hard to eradicate. Experience elsewhere, however, is all on the other side. A schoolhouse on a farm does not necessarily make farm land valuable. What is wanted is that the opportunity of attending a good school be within easy reach of the children, and a good school six miles away, with transportation, will add more to the value of farm property than a poor school brought to within a quarter of a mile. Such, at least, is the experience of states where the plan has been tried. The novelty of the idea is to many an objection. Most communities move and think slowly, and many are content with things as they are, and oppose efforts looking toward change and improvement. For such people no amount of argument is so effective as a successful, centralized school in the vicinity. It was very difficult to introduce the first centralized schools of Ohio and Indiana, and the movement began slowly and, in Ohio, under carefully devised restrictions imposed by the legislature; now centralization is in process throughout the entire region, and the restrictions have all been removed.

The first state to pass an act permitting the consolidation of schools was New York (Union School Law of 1853, amended and incorporated as Title IX of the Consolidated School Act of 1864). This was followed by the passing of an act permitting both the consolidation of schools and the expenditure of funds for transportation by Massachusetts, in 1869. In 1874 the law was put into operation for the first time by the town of Quincy, but it was not until 1890 that the movement gained much headway, or the expense for transportation in the state reached $25,000. Since that time the progress of the movement has been rapid. The movement was not taken up in any other state until 1889, when the Connecticut legislature first authorized the consolidation of districts. The next legislation was in 1893, when Connecticut authorized the expenditure of funds for transportation, and Maine authorized the consolidation of schools. Rhode Island and New Hampshire followed in 1898, and Vermont in 1902. Pennsylvania authorized the expenditure of school money for transportation in 1897, and the consolidation of schools in 1901. Ohio first authorized the consolidation of one township in 1894; permitted consolidation in three counties in 1896, and made the law state-wide in 1898. Indiana first authorized consolidation and transportation in 1899. In some of these states local school authorities had previously initiated such plans without state authorization.

Partly due to the greater density of population, and partly due to the large number of small schools previously maintained, the movement has made much headway in the New England states. In Massachusetts no figures as to the cost for transportation were kept before 1889, when the yearly expense reached $22,118. By 1897 it had exceeded $100,000; by 1905 it had exceeded $200,000; and at present amounts to close on $300,000 a year. This is equal to about 1¼ per cent of the total cost of the school system of the state. In Connecticut 81 of the 168 towns had consolidated schools and were transporting pupils by 1909, and from 45 to 80 schools are being closed each year. The cost for transportation here is about 1 per cent of the cost of the system. In Vermont and Maine nearly 4 per cent of the total cost of the schools is expended for the transportation of pupils from abandoned schools. Towns in Rhode Island and schools in New Jersey are given an additional appropriation each year of $200 for every school they have abandoned in the process of forming a consolidated school. Pennsylvania and New York have as yet done little with the idea, though the possibilities in each state are large.

Perhaps the greatest development of the plan has been in the states of the North Central Division, all of which, except Illinois, have laws permitting the formation of consolidated schools and the transportation of pupils. All new laws enacted in this group of states have been passed since 1894. In Ohio, Indiana, and Iowa perhaps the greatest success has been attained, and Indiana has probably done more with the plan than any other state in the Union. The great success of the plan in Indiana has been in great part due to the absence of the district system, and the consequent freedom for an intelligent township officer to go ahead and do what ought to be done. In the ten years from 1899, when the first law was passed, to 1909, the number of schools of less than twenty children was reduced from 4180 to 1755; 1611 small schools were abandoned; and more or less complete consolidation was effected in 486 of the 1017 townships in the state, or, stated better, in 486 of the 595 townships in the state reporting roads which would permit of the consolidation of schools. Approximately 25,000 children are transported to and from school each day at public expense, and about 2500 privately. 1116 transportation wagons are used each day, at an average cost of $2.07 per wagon, and about 500 children are transported daily in interurban trolley cars. Michigan, Wisconsin, Minnesota, and Nebraska have also made some good progress in inaugurating consolidation and transportation, and every other state in the division except Illinois has made a beginning.

Among the Southern states, some marked progress in the consolidation of small and unnecessary schools has been effected, since 1900, North Carolina, Georgia, Florida, and Louisiana having been most conspicuous in the work. On the other hand, no provision whatever for consolidation or transportation has so far been made in the laws in four other Southern states. The county system of school administration which prevails in most of the Southern states makes it easy to effect the consolidation of small and unprofitable schools.

In the states of the Western Division little has been accomplished, due largely to the distances between schools and to the scarcity of population. In five states and territories no laws have been enacted, while in the others the laws are merely permissive and are rather difficult to put into operation. All Western Division laws on the subject have been enacted since 1902. Except in a few rather well-populated portions of some of the Western states, the need is for more rather than for fewer districts.

All forms of transportation are employed. The Connecticut school reports list the different means employed in Connecticut, the number transported by each, and the daily and total cost. Transportation wagons, steam and electric cars, butcher and milk wagons, and allowances of money to parents are employed. The same is true of all of New England. In Ohio and Indiana we have the best examples of a well worked-out plan of transportation, with a special type of school transportation wagon, definite routes, yearly competitive bids and written contracts, drivers acting as truant officers and under bonds for the faithful performance of their contracts and for the proper care of the children, etc. The cost of transportation is relatively small, and usually very material gains in money as well as in educational efficiency are made by consolidating schools and transporting the pupils. In Indiana the average cost per wagon per day is $2.07, which is equal to eleven cents per pupil per day, or $13.20 per year for a six months' school. In Connecticut and Vermont the cost varies from year to year, but averages about

$16 per pupil per year, though for a longer term of school. E. P. C.

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CONSONANCE AND DISSONANCE. — These terms refer to the relative agreement or disagreement of a combination of simultaneous tones. (See Chord, Discord.) Three stages are usually distinguished: perfect consonance, imperfect consonance, and dissonance, although there is no sharp line of demarcation between them. Consonance is usually pleasant and dissonance unpleasant, but this is largely a matter of taste and mode of use. Consonance gives a feeling of rest, while dissonance gives rise to unrest, and must always be resolved before the end of a movement. The degree of agreement or disagreement varies with the complexity of the ratio which denotes the interval (*q.v.*), or the relation of the vibration frequencies of the combining tones. Thus, the octave, 1:2, and the fifth, 2:3, are perfect consonances; the major third, 4:5, the minor third, 5:6, and the minor sixth, 5:8, are imperfect consonances; combinations with more complex ratios are considered dissonant. There is great disagreement between musicians on the nature and limits of these demarcations. "Consonance and dissonance have been explained; (1) by an unconscious apprehension of, and a conscious satisfaction and dissatisfaction with, simple and complex vibration ratios (Lipps); (2) by the presence or absence of beats (*q.v.*) (Helmholtz); (3) by degree of direct tone relationship (Wundt); (4) by degree of fusion of constituent tones (Stumpf, Külpe)." See Baldwin, *Dict. of Phil. and Psych.* C. E. S.

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CONSTITUTIONAL PROVISIONS RELATING TO EDUCATION. — Education was not mentioned in the Federal Constitution, this matter being one of a number which was left to the states to deal with as they saw fit. The failure to mention the subject in any way is easily understood. At that time education was not a national interest, but a purely local matter. The need of general education at that time was small indeed. The industrial development, which began with the Embargo of 1807 and the War of 1812, resulting in the development of the factory system and the specialization of labor; the development of new means of intercommunication, which began with the steamboat and the steam engine, and which substituted interdependence for the independence which had previously existed; and the development of labor organizations and the awakening of the many humanitarian movements, after about 1820, all of which began to claim education as a right and to demand tax-supported schools; — none of these had as yet manifested themselves when the Federal Constitution was formed. For the most part education was not then considered as a function of the State, and except in New England it was left to religious societies and to private individuals to provide for those who felt a need for it, and were able to pay for it.

Gradually this condition of indifference was changed to one of interest in public education, though the change took place but slowly and only after great efforts. The change was everywhere a gradual one, and it was accomplished only after vigorous campaigning, and against much opposition. The land grants of Congress to the new states for the benefit of common schools greatly stimulated the movement. The idea that education was a birthright and that free education was an economic and a political necessity was advanced, and was accepted gradually by our people. Just when this change took place cannot be definitely stated. In a general way it had clearly begun by 1830, but was not accomplished in many states even of the North until after the Civil War. The vital educational awakening of the people of the South is a matter of the last decade. (See

SOUTHERN EDUCATIONAL MOVEMENT.) To-day the right to a full and complete education at public expense may be regarded as a settled conviction of our people, and education has become to-day one of the greatest interests of the states and of the nation.

In May, 1776, the Continental Congress recommended that the states, where the existing governments were not sufficient, " adopt such government as shall, in the opinion of the representatives of the people, best conduce to the happiness and safety of their constituents in particular and America in general." All of the states except Connecticut and Rhode Island, which considered their colonial charters sufficient, drew up and adopted more or less perfectly worked out constitutions. Most of the states revised their constitutions at the time of entering the Union, and a number amended their constitutions one or more times during the first two or three decades of their national life. Three new states, Vermont in 1791, Kentucky in 1792, and Tennessee in 1796, entered the Union before 1800, and likewise framed constitutions. During the next fifty years fifteen additional states were admitted to the Union, and these included every state east of the Mississippi River and all of the states in the first tier west of the river except Minnesota.

An analysis of the provisions contained in these early constitutional provisions reveals much as to the feeling at that time toward education as an interest of the state. Seven of the first constitutions in the eleven original states framing them made no mention of the subject; Georgia authorized its legislatures to establish schools, according to its discretion; Pennsylvania and North Carolina directed their legislatures to establish schools, in which the masters, owing to subsidies, should " instruct at low prices." Massachusetts made careful provision for the safety and perpetuity of Harvard College, and added a general section on the encouragement of learning, which has remained unchanged ever since. When New Hampshire was admitted as a separate state it copied the Massachusetts general section. Pennsylvania, in its second constitution of 1790, made provision for the organization of charity schools in the state. In some of the states the first constitutional mention of education does not occur until well along toward the middle of the nineteenth century, and in most of the Southern states no definite provision for a system of education was made until after the Civil War.

The constitutions of the New England states have been changed but little, and are representative alike of the earlier conditions and the earlier theory of government. The educational provisions in the constitutions of Connecticut, Massachusetts, and New Hampshire, for example, are simple and indefinite. Little was put into the constitutions in this earlier time, and much was left to the legislature to determine. As time revealed the defects in the earlier theory of government, and as the suffrage was widened to include numbers of relatively unintelligent voters, we find the constitutions becoming longer and more explicit. The New York constitutions of 1778, 1822, 1846, and 1894 are examples of this. Each is longer than that preceding it, and with reference to education the constitution has changed from no mention at all to very specific commands.

The New York constitution of 1778, and the amendments of 1801, made no mention of schools or education. The constitution of 1822 merely defined the common school fund, and declared that the interest on it should be applied to the support of common schools. The constitution of 1846 declared the common school fund, the literature fund, and the United States Deposit fund to be inviolate funds, and definitely appropriated the income. The constitution of 1894 contained four sections on education instead of one. The first section laid a definite mandate on the legislature to " provide for the maintenance and support of a system of free common schools " throughout the state; the second continued the Board of Regents of the University of the State of New York, but subjected them and their work to the control of the legislature; the third reproduced the educational section of the constitution of 1846, with reference to the educational funds and their use; and the fourth forbade the use of public funds to aid sectarian or denominational schools.

As the land-grant policy of the national government began to influence and stimulate educational development, we find the people throwing more and more carefully devised safeguards around these endowments to prevent their loss or misappropriation. Ohio is the first state (1802) to show this in its constitution. In many of the earlier constitutions in the land-grant states, the article on education contained little or nothing else than such safeguards. The demand for the division of the school funds and state aid and support for parochial schools, made by the Catholics, after the new city and state school systems began to assume proportions and to exert an influence, which everywhere met with failure after 1840, resulted first in laws, and later in constitutional prohibitions, forbidding the diversion of public school funds or the appropriation of money in aid of any private, sectarian, or denominational teaching in the public schools. (See PAROCHIAL SCHOOL SYSTEM.) The first state to insert such a prohibition was New Jersey, 1844, and, since 1865, almost every state admitted to the Union or which has revised its constitution has included such a provision; Illinois, in 1870, added an elaborate and a very stringent provision prohibiting such aid or the introduction of sectarian instruction, and this has been copied by Missouri, Montana, and Idaho. One state west of the Mississippi River, three states not located along the Atlantic seaboard, and only twelve states in all do not have such a constitutional prohibition.

With the gradual change in the conception of education, which took place quite generally in the Northern states by 1850, we find not only a more definite statement of what is to be done, but also an extension of the provisions for education by the state. Constitutions consequently became more bulky, definitions were made more exact, and duties were more explicitly laid down. This tendency became very marked in the Southern states after the Civil War, and has also been characteristic of the constitutions of the newer Western states. Almost every constitution adopted since 1865 has contained a long article on education, outlining a school system for the state. Land grants, permanent funds, executive boards and officers, taxation for education, the extent of the system, universities, normal schools, textbooks, — these and other features have been defined and explicitly provided for. Each revision of a constitution has tended toward more perfect safeguards, clearer definitions, the change of consent to command, more extensive requirements, and very clear and very positive mandates to the legislature to provide "a uniform system of free public instruction for all the children of the state." At times, advantage has been taken of the opportunity to insert requirements into a new constitution which the people, as represented in their legislatures, have not, up to that time, thought advisable or possible, but gradually the more enlightened public opinion of the state has made itself felt, the advanced provisions have proved useful, and lasting results have been attained. E. P. C.

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CONSTRUCTIVE GEOMETRY. — A term applied to early steps in the use of the compasses and the straight edge in effecting geometric constructions. An effort has of late been made to introduce this subject into the elementary grades, usually in the seventh and eighth school years. Several textbooks relating to the subject have appeared, and in some schools it is required. One reason for this is the fact that the art work of the schools has become less mechanical, and the drawing of geometric figures has practically ceased to be included. As a phase of manual training this work has some value, especially if some motive is furnished, as when it is correlated with woodwork or design. When, however, it is not related to other interests of the pupil it has generally proved to be rather barren of results. At the present time considerable work of this kind is being done, by many teachers, as a preliminary to the study of demonstrative geometry, and with gratifying results. The pupil is thus introduced to the use of the tools of his subject, and is given some motive for the demonstrative work. The constructing of simple patterns of artistic form is in itself a motive that usually appeals to pupils, so that the work is pleasurable and profitable. The work also has a value because it requires the use of the same tools that are employed by the artisan in preparing his working drawings. D. E. S.

CONSTRUCTIVE IMAGINATION. — See Imagination.

CONSTRUCTIVE WORK. — See Manual Training.

CONSULAR SERVICE, EDUCATION FOR. — See Public Service, Education for.

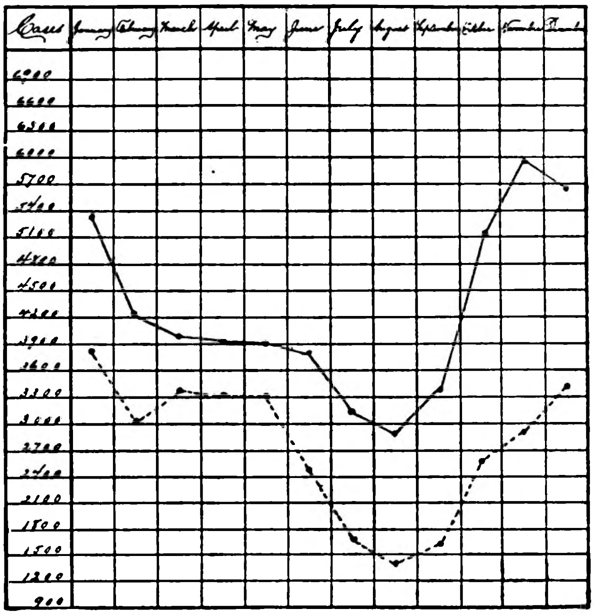
CONSUMPTION. — See Tuberculosis.

CONTAGIOUS DISEASES. — The aim of school hygiene is to protect a child from his foes. The most fatal of these are the diarrhea diseases of the first year of life, tuberculosis, and the contagious diseases, the so-called school diseases, of which the chief are diphtheria, scarlet fever, measles, and whooping cough. Extensive studies indicate that over ninety per cent of the deaths from these contagious diseases occur before the age of ten. Even those diseases not ordinarily considered especially serious, such as measles and whooping cough, are often fatal in these early years. In the case of measles, for example, there is great mortality in the early years of life among the children of the poorer classes, at least in European cities, where extensive investigations have been made.

Contagious disease is also a great handicap to school instruction. The great injury to school work from epidemics of disease has been pointed out recently by Secretary Martin in a report to the Massachusetts Board of Education. He writes: "In consequence of the presence of some infectious disease, chiefly diphtheria, scarlet fever, or measles, during the school year of 1906–1907, 318 schoolrooms were closed and classes dismissed. These rooms were in seventy towns. The classes included 12,122 children. The closure lasted from one day to four weeks. The waste of money involved in the cessation of work for days or weeks of more than 300 teachers and the loss of schooling suffered by the 12,000 children is a matter of no small moment; but what we may read in the statistics of diseases and defects not numerous or serious enough to cause the closure of the school is of much greater moment." Thus here as elsewhere it is for the interest of the school to make adequate provision for the hygiene of childhood.

The health of children is determined largely by three factors: heredity, the home, and the school. While the first two of these factors cannot be controlled by the community, the third factor, the school, can be regulated in the interests of health. Thus the school, where practically all of the children of the community are brought together, offers a most favorable opportunity for controlling and averting disease, and on the other hand a most dangerous center for the spread of disease. That the school is an important factor in spreading contagious diseases, has been shown, not only by everyday experience, but also by the results of special investigation. Koroesi, for example, long ago found, during the three quarters of the year when the school was in session, 4400 cases of measles per month, but for the vacation month of August, only 780 cases; for the month of September, the first of the school year, only 639; and only 1695 for October. Taking the four quarters of the year, there were for the three months of vacation only 3054 cases, while for the first quarter of the year there were 11,865; for the second, 13,358; for the third, 13,147. In part this might be accounted for by the influence of the seasons and other factors, but further proof of the causal relation between school attendance and the spread of measles was the fact that when the time of vacation was changed — as occurred one year on account of the cholera — the period of minimal number of cases was altered correspondingly. Dr. Hodge found similar results in Worcester.

Scarlet fever, diphtheria, and whooping cough, are also spread by the school. Dr. McCollom's studies (see accompanying chart) give an interesting illustration of the incidence of diphtheria and scarlatina during the months of the year. We have, then, the following facts. These contagious diseases occur especially in the early years; the mortality is greatest in the early years; they occur most frequently during the months of the school session; the danger of infection seems to be usually greatest in the early stage of these diseases. The aim of hygiene is to postpone contagious diseases to as late an age as possible. Epidemics should be kept out of the kindergarten, at whatever cost to school work. The postponement of such diseases even to the elementary grades means that a smaller number of children will have them at an early age, and hence that there will be a smaller number of fatal cases. And the aim is also to make the time between epidemics as long as possible; for this again means that fewer young children will have the disease. The objection may be made that postponement of an epidemic to the higher grades of the school will not save the younger children in the homes from contagion. This of course is true, but the children in the higher grades are likely to have fewer young brothers and sisters at home than children in the lower grades.



Diphtheria, 51,621 cases. Scarlatina, 33,455 cases. Vacation, July and August, average number of cases of diphtheria, 3067. Term time, average number of cases of diphtheria, by months, 4548. Vacation, July and August, average number of cases of scarlatina, 1622. Term time, average number of cases of scarlatina, by months, 3021.

Among the means by which contagious diseases may be spread in the schools are the following: the dust of the schoolroom, common drinking cups, common towels, flies, and textbooks, slates, pencils, and the like. But the most important means is that of contact with other children who are infected. All other means seem insignificant as compared to this. In case of diphtheria the germs are often carried by healthy individuals, and such "carriers" are perhaps the most common and dangerous means of spreading the infection. While the State compels children to attend school, there is morally no option about making school conditions hygienic. And further the interests of the taxpayer as well as the demands of pedagogy and the higher claims of humanity require scientific management of school diseases.

As regards details, the regulation of contagious diseases in this country is left largely to the local authorities. The Massachusetts law is perhaps a fair sample of the state legislation. As amended by the acts of 1906 and 1907 it is as follows: "A child who has not been vaccinated shall not be admitted to a public school except upon presentation of a certificate granted for cause stated therein, signed by a regular practicing physician, that he is not a fit subject for vaccination. A child who is a member of a household in which a person is ill with smallpox, diphtheria, scarlet fever, measles, or any other infectious or contagious disease, or of a household exposed to such contagion from another household as aforesaid, shall not attend any public school during such illness until the teacher of the school has been furnished with a certificate from the board of health of the city or town, or from the attending physician of such person, stating that danger of conveying such disease by such child has passed."

The important points as regards the period of incubation, the duration of infectiousness, and the period of isolation that should be required are given by Dr. Herrman in the following table based upon experience and practice in New York City: —

[redacted]

DISEASE	Incubation Period	Incubation Period in the Majority of Cases	Incubation Period in the Greatest Number	[redacted] Duration of Infectiousness	Period of Isolation		Duration Isolation of other Members of Family, who Removed Immediately
					Mild cases	Severe cases	
	Days	Days	Days		Days	Days	Days
Scarlet Fever . . .	1–8	2–4	2–4	4–8 weeks. While there is a discharge. Chiefly in early stage.	28	56	8
Measles	8–16	10–13	11	2 weeks? Chiefly from the appearance of catarrh to eruption.	10	21	14
Diphtheria	2–7	2–4	2–4	Until culture is negative. Usually 10–21 days.	10	28	4
Chicken Pox . . .	13–19	14–17	15	Until the removal of the scabs, 2 weeks.	14	21	17 (Not excluded if have had.)
Whooping Cough . .	7–14	10–14	14	Usually 6 weeks from beginning of the whoop. Until no spasmodic cough.	21	56	14 (Not excluded if have had.)
Mumps	14–28	17–20	19	2 weeks.	14	28	20 (Not excluded.)
German Measles . .	12–22	14–17	16	1 week? (Probably less.)	7	10	17 (Not excluded.)

In order to control contagious diseases, medical inspection, the services of school nurses, and the coöperation of teachers, are all required. The school physicians should visit the schools daily for the detection of contagious diseases; school nurses should follow up these cases in the home; and teachers should be trained to detect the symptoms of such diseases in their incipient stage. Dr. Herrman has formulated the following helpful list of suggestions to teachers regarding medical inspection: " Please send to the medical inspector: (1) Pupils who show any symptoms which may indicate the onset of a contagious disease. (See below.) (2) Pupils who have been excluded on account of contagious diseases. (3) Pupils who have been absent for three or more days on account of sickness of any kind.

" Pupils presenting one or more of the following symptoms may be regarded as suspicious. Marked pallor, flushing of the face, or any eruption upon the face, head or hands. Peeling of the skin, red eyes, running nose, or any discharge from the ears or nose. Swelling of the face or neck. Hoarseness, croupy cough, vomiting. Also those who complain of feeling chilly, feverish, having a sore throat or headache. Do not depend on your own diagnosis. Notify inspector if several cases of one contagious disease occur in your classroom, and if any case is not reported on the daily list.

" Symptoms which may indicate the onset of a contagious disease: —

" Scarlet fever: vomiting, flushed face. Advanced cases: peeling of the skin of the hands, or a discharge from the nose or ears. Measles: sneezing, cough, redness of the inner corner of the eye, sensitiveness to light, running of the nose. Diphtheria: sore throat or pain on swallowing, even if slight; hoarseness, a croupy cough, irritating discharge from the nose. Mumps: pain in front of the ear in eating or talking, swelling in front of and under the ear. Whooping cough: a spasmodic cough in which the child strains himself and the face becomes somewhat red. Later there may be vomiting or a whoop. Chickenpox: an eruption of small blisters on the face or scalp. German measles: red spots on the face. Influenza: redness of the eyes, running nose, soreness of the throat, headache, soreness of the entire body. The teacher should keep a list of the pupils absent on account of contagious disease. This should include the name, disease, date of exclusion or absence, and date of return."

The important means of controlling the contagious school diseases may be summed up as follows: (1) Daily medical inspection of all pupils. If teachers are trained to intelligent coöperation with the medical inspector, contagious diseases should be detected in their first stages by such daily inspection. (2) In order to control contagious diseases, cases must be followed into the homes, and for this purpose school nurses are necessary. (3) Not only is the exclusion of all cases of contagious diseases from the school necessary, but also all children from the same families should be excluded for a suitable period, except in the case of measles. Children of the same family who have already had measles may be permitted to attend the school, since this disease is not carried by a well person. (4) School closure in case of need should be resorted to. Whether or not school closure is an advantage depends upon the special situation and the disease in question. Usually in case of diphtheria, for example, the disease can be regulated better with competent medical inspection if the schools are continued than by closing; for in case of closure there is no guarantee on reopening the school that the children are not still bearers of the disease. In the case of measles, on the other hand, it is often an advantage to close the school some seven days after the detection of the first case, so that the second crop may occur when the children are at home. (5) Registration of all cases of contagious disease and a complete morbidity record for each pupil are necessary so that school officials and medical inspectors can always know just how much susceptible material exists. W.H. B.

See DIPHTHERIA; EXCLUSION FROM SCHOOL; INFECTIOUS DISEASES; MEASLES; MEDICAL INSPECTION; SCARLET FEVER; WHOOPING COUGH.

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CONTENT. — In the discussion of mental processes it is convenient to distinguish between the form of the organization of these processes and the factors which enter into the processes. The factors which go to make up any mental process are designated content. The sensory elements of experience, such as the blueness of a given surface, may be recognized as content. The form in which this surface appears, its relation to other objects, and especially its relation to processes of volition, may be distinguished from its content. In educational discussions the subject matter of a study constitutes its natural content and questions relating to subject matter very frequently depend upon very different principles from those which are involved in the discussion of organization and arrangement.

CONTENT SUBJECTS. — A phrase applied to those common school subjects where formal or conventional facts are relatively less important and therefore less emphasized than natural facts. Geography, elementary science, nature study, history, civics, literature, etc., have usually been regarded as content subjects. Arithmetic, reading, writing, spelling, penmanship, etc., have usually been regarded as formal subjects. The distinction is now much less used, as it is much less valid for present day teaching. Every subject may be said to have its formal and content aspects. H. S.

See COURSES OF STUDY; DUALISM; FORMAL SUBJECTS.

CONTEXTUAL METHOD. — A special method employed in teaching the meaning of new words in reading, language, or spelling. The child is given the word in various language settings, so that each situation will help to convey its significance, care being taken that the context is familiar. The contextual method usually supplements the "definition" or "dictionary" method, and the "objective" method. The "contextual" method is also used in testing the child's mastery of the meaning of words, the word to be tested being dictated in the context of a sentence. H. S.

See READING, TEACHING OF; SPELLING, TEACHING OF; DICTATION, METHOD OF.

CONTIGUITY, ASSOCIATION BY. — See ASSOCIATION.

CONTINUATION EDUCATION.— The term "Continuation School" has recently been coming into vogue to describe comprehensively any kind of training which is adapted to people who are already at work. A detailed description of various types of continuation schools will be found under the terms: APPRENTICESHIP EDUCATION; EVENING SCHOOLS; CORRESPONDENCE SCHOOLS; INDUSTRIAL EDUCATION; YOUNG MEN'S CHRISTIAN ASSOCIATION, and UNIVERSITY EXTENSION; also, since this form of education had its origin in Germany, and has to-day its most extensive development in that country and in England, special consideration will be given to it in the articles devoted to education in those countries.

The German continuation schools are of two principal types — general and industrial. Both had their beginnings many centuries ago, in the attempts to provide more adequate instruction in Christian doctrine and in industrial subjects for young people. Since 1870 both types have developed rapidly, and the general trend has been, in view of the universal prevalence of complusory general education, to make them reënforce industrial training. In 1891 appeared an imperial decree, making it compulsory upon employers and parents to send their children to continuation schools wherever these might be established by the State. Only rarely does the imperial government of Germany attempt to regulate education, and naturally this decree has attracted widespread attention; as a result of it, attendance on continuation schools has become obligatory in many of the smaller states of Germany, and in parts of Prussia. The tendency is to substitute, for continuation work on Sunday and evenings, six or eight hours per week of the day period. In the industrial schools there is, as a rule, no concrete or practical teaching, the studies being mainly of a technical character and connecting rather intimately with the practical work pursued by the apprentice during the day.

In England continuation work has found its development in a very extensive system of evening schools (*q.v.*) a considerable number of which have been designed primarily to give a further industrial education of young persons already employed. The national government assists these evening schools by generous grants, but nowhere is attendance obligatory. In some cities the attempt is made to have the same students devote part of their time to technical studies, part to cultural pursuits, and part to physical drill and recreation. The total attendance in the continuation schools of England is very large, but many of the conditions are unsatisfactory. Attendance in the evening, when the youths are tired, fails to provide the requisite energy and alertness for the learning, especially of the different technical subjects. Teachers cannot be trained specially for this work, and satisfactory supervision of it is yet difficult.

In America an extensive system of public evening school education is to be found in the larger cities; relatively little of it is of an industrial character as yet, but the tendency is to increase the opportunities for technical training. In some cities continuation education in English for foreigners has attained considerable proportions. In a few cities a distinctive type of cultural work, corresponding to that found in secondary schools, has been developed, but in few cases have the evening high schools yet succeeded in covering all of a regular high school course. A great variety of continuation work is to be found in American cities under religious and philanthropic auspices; this will be discussed under the topics suggested above.

The present trend of public opinion in all countries having continuation work is that so much of such work as presupposes hard work and a state of mental alertness (such as technical, language, and other studies pursued for the purposes of distinct achievement) should be placed in day, rather than evening hours, and that the evening schools should be reserved for work more distinctly recreative in character, or cultural, in the sense that its effects can be realized without too great exertion on the part of the student; in other words, lectures, music, drama, and general information courses can be given in the evening, as well as swimming, gymnastics, military drill, dancing, and games designed for physical development; but drawing, mathematics, science, economics, and the other studies designed to promote efficiency for industrial purposes, or other studies like history, literature, and science, taken for cultural purposes, but with the aim of securing a diploma, should be reserved to day hours. This generalization, of course, applies primarily to youths under seventeen or eighteen years of age who are still plastic in bodily development, and whose need of rest is considerable. For people beyond these ages, evening schools of various types may continue to provide the necessary means of further training or culture. It will be noted that the placing of continuation work during day hours will make it possible to develop a special teaching force for it, inasmuch as it would be arranged that the pupils should appear in relays, the same teacher dealing with successive groups; in this way, a specialized teaching force could be developed for the handling of any special phase of continuation work.

The above-mentioned tendencies in continuation work will require the coöperation of employers, and will probably demand compulsory legislation. The logic of the situation is clear to students of education, and it is probably true that Germany, in this respect, is simply anticipating a development that will soon become prevalent wherever continuation work is found.

D. S.

See APPRENTICESHIP EDUCATION; EVENING SCHOOLS; INDUSTRIAL EDUCATION.

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CONTRACTILITY. — The power of protoplasm, or of living cells, to undergo transformations in form by contraction or expansion in response to incident forces is known as contractility. The muscle cell possesses this power in a high degree of development, and it is by virtue of the contractility of muscles that the higher organism moves. Amœboid movements, ciliary movements, and the movements (contractile or expansile) of muscle cells are varied expressions of the property of contractility.
R. M. Y.

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CONTRAST. — When two mental processes are of the same general type but fundamentally different in quality, attention is drawn to both mental processes through this fundamental difference. The difference itself is described as the contrast and the value of studying contrast in psychology and in education depends upon the fact that attention can be aroused through contrast. Thus two colors which differ radically from each other in quality, as, for example, two complementary colors, exhibit a sharp contrast. A transition from a high shrill tone to a low dull tone gives a contrast which will draw attention to both of the tones. Changes in subject matter and in forms of presenting subject matter constitute contrasts which are advantageous because of the attention which they arouse. C. H. J.

See Analogy; Association.

CONTROL. — The conception of control, borrowed from biological considerations, is destined to an important rôle in the philosophy of education. Under the caption of adaptation (*q.v.*) it has been pointed out that active adaptation involves a capacity to modify the environment or medium of life in the interest of the purposes of the organism. Inanimate things manifest no power to subject the environment to the maintenance of their own individual character; while the higher the type of life the more highly developed is this function of control. Every physiological organ, every instinct, every habit and every so-called mental faculty is to be regarded as a more or less specialized instrumentality of control of some corresponding phase of the physical and social environment. Accordingly the principle acquires significant application to education in all matters of psychophysical and also logical training. The useful habits of action and of thought which pupils are to acquire are to be conceived as so many modes of control of conditions for the sake of ends. These habits — even those of a more theoretical character — represent so many efficiencies, not so many self-justifying ends. (See Pragmatism.)

Looked at as methods of control, our mental powers may be classified as direct and indirect agencies of subordinating the environment to the ends of life. Seeing, hearing, handling, touching, smelling and tasting, locomotion, reaching, etc., *i.e.* all the sensible and motor activities, represent direct means of controlling the environment, touch being the most immediate mode, and the higher or intellectual senses, seeing or hearing, the more mediate modes. Thinking and its instrument, language, represent, on the other hand, the indirect forms of control. Hence they are not directed or discharged at once upon the external world of nature and society, but have to do with elaborating plans and methods by which the direct (the sensorimotor) organs may better perform their functions. When it is said, for example, that an idea is inherently a "plan of action," it is meant that an idea is such an interpretation of sensory stimuli as enables them to evoke more comprehensive and significant types of action and values of objects than they would excite if left to themselves. In this way modern functional logic gets beyond the onesidedness of both historic empiricism and rationalism. Recognizing with empiricism the part played by sensation in building up the higher forms of mental life, it still holds that an idea is never a mere composite or associated aggregate of sensations, since it always involves selective arrangment of sensations with reference to a future more complete mode of activity. In like fashion, functional logic recognizes with rationalism the constructive and organized rôle of thoughts (which in the case of some ideas may be sufficiently commanding to entitle them to be named "categories" of experience), but instead of regarding this power as an absolute and independent, or *a priori*, possession of thought, it is regarded as arising out of the need of better control of the sensorimotor organs, and as requiring to be experimentally tested. All genuine thoughts are *a priori*, but only in the sense that they anticipate and endeavor to regulate some future experience, *i.e.* they are plans of action. Their degree of failure or success in the work of anticipation and control nullifies or corroborates them and leads to further revision and perfecting. So far as control becomes perfect, the thought ceases to be thought and becomes an automatic habit; so far as it lapses, under changed conditions into an inadequate mode of control of a future experience, reflection is again set up. J. D.

See Conflict.

CONTROL (PSYCHOLOGICAL). — This term has come into technical use to indicate a phase of development which is superior to habit. It refers to the fact that after a habit has been formed its use in a given situation depends upon the intelligent direction of this habit toward clearly recognized ends. Thus one may have a certain habit of facial expression. If in addition to the habit he is able to control the facial expression, he may employ the expression at such times as shall be advantageous for purposes of social communication. Lack of control signifies an inability to utilize a habit intelligently. Thus one is not always able to control his tendencies toward such a form of expression as yawning or sneezing. The development of control in connection with the training of habits is of the highest importance. The mere training of an automatic movement may be of relatively little value from an educational point of view, but the development of control is of the highest significance. C. H. J.

See Activity; Attention; Habit.

CONVENT SCHOOLS. — The term "convent," originally referred to the local organization or community as distinguished from the house or the order; by popular usage, however, " convent " refers to such a home or order for women, while " monastery " in a similar way refers to those for men. Convent schools owe their origin to the monastic settlements of women which began to spring up in the fourth century, but the education of young women for the world, which in our day has called into existence so many teaching communities, formed no part of the original purpose of the early settlements of women that looked to St. Basil and St. Augustine (*qq.v.*) for direction. The impulse which peopled the desert of Egypt with hermits moved many Christian women in the upper ranks of Roman society to abandon the luxury of the world and to seek in the seclusion of the cloister an opportunity to put into daily practice the evangelical counsels and to seek to realize in their lives the lofty ideals of Christian virtue. The educational work carried on by these early communities was directed chiefly to the preparation of their own members for the worthy discharge of the duties of the monastic life.

With the invasion of the barbarian tribes of the north, monasticism for women entered upon a new phase, and the convent school took on a different character. In the early days of the invasion the men among the upper classes of the Germans and Franks evinced little inclination for the monastic life. Many tempting careers were open to them in the Roman world. Moreover, their time was largely occupied in petty warfare. But with the women of the upper classes the case was very different. Accustomed for generations to wield authority among their own people, and possessed of no less restless energy than their brothers, they found all avenues in the Roman world closed to them. Under those circumstances many of them left the court to seek in the cloister protection from the turbulence of the times and to pursue the Roman culture which still survived in the convents. These royal ladies, however, were not characterized by meekness and humility. They not infrequently adopted the religious life as a profession. They took with them a domineering character, a quick determination, and a clear-sighted appreciation of the possibilities which the monastic life opened up to them. Many of them, however, were transformed by the religious spirit and the discipline of the convent, and rose to great heights of sanctity. From the sixth to the thirteenth century many monasteries for women were founded by members of the royal family. The abbesses of these houses were not infrequently the wives or daughters of reigning princes. While living in the convent, these ladies kept in touch with worldly affairs and took a large part in shaping the nascent nationalities and in developing the civilization of western Europe. These convents were enriched by grants of land from their royal patrons, and they obtained many privileges from the Roman pontiffs. They usually sided with the Pope, and were frequently involved in contentions with local ecclesiastical authorities. This phase of convent life attained its most characteristic development in Saxony. The abbesses of the Saxon monasteries were usually members of the royal family, and held a place of authority second to no woman in the land. They held their abbeys from the King, which precluded a dependent relation on lords temporal or spiritual. The Abbess of Gandersheim, one of the most famous of these convents, held rights of overlordship over many miles of the surrounding country. She exercised the right of ban. She issued summons to her dependents when war had been declared, and sent her contingent of armed knights into the field. She issued summons to attend her court, and was in turn summoned to the Imperial Diet. The Abbesses of Quedlinburg and Gandersheim held the right of striking coin in the reign of Otto I. During the minority of Otto III, his mother, together with his aunt Mathilde, Abbess of Quedlinburg, practically ruled the empire, and during a prolonged visit of the Emperor in Rome in 997 the management of affairs was given to the Abbess Mathilde, who has often been praised for the determined measures which she took to oppose the invading Wends. In 999, on her own authority, she summoned a diet at Dornburg. A similar state of affairs obtained in other parts of Europe. In England the abbesses of many monasteries ranked with barons.

The educational activity of the convents during this period may be seen from many documents which have come down to us. Cæsarius, Bishop of Arles, 501–573, wrote a rule for a community of nuns which he established in his diocese under the government of his sister Cæsaria. The nuns were forbidden to take children under the age of six or seven, and were cautioned against readily accepting the daughters of nobles or lowly born girls to be brought up and educated in the convent. Considerable time was to be devoted to the study of music, with a view to preparing the nuns to take part in the chants and choir singing in connection with the religious exercises of the convent. A training in reading and writing was prescribed for all the members of the community. Spinning and weaving woolen fabrics from which the nuns made their own garments constituted a part of their work, but their highest efforts in weaving and in artistic needlework were devoted to the making of church hangings and vestments. This rule reveals a transitional phase in the educational work of the convent between that of the early monasteries, which was exclusively for the nuns, and the later convents, which became the home of learning and the recognized schools for the daughters of the upper classes. The educational side of convent life perhaps reached its highest development in Saxony. Many of the children who went to these Saxon convents on completing their education joined the community, while others returned to the world to be married. Widows often returned to the convent to spend their declining years in the home of their childhood. The convents of Herford, Gandersheim, Essen, and Quedlinburg gave a domestic and intellectual training of a very high order. · The term " college " in its modern sense has often been applied to these institutions, and rightly so, for they not only gave the best education of the times to the girls who assembled there, but they were the permanent homes of many learned women who devoted their lives to literature and the fine arts. A convent school education in those days conferred distinction on all those who were fortunate enough to receive it.

Bede (*q.v.*) writing of Anglo-Saxon England in the seventh century, says: "Many were wont for the sake of the monastic mode of life to go from Britain to the monasteries of France and Gaul. They also sent their daughters to the same to be instructed." In Anglo-Saxon England the first monastery for women was probably that founded by Eanswith, daughter of King Eadbald, in 630. The convent of Liming was founded by Queen Ethelburg about the middle of the seventh century, and that of Sheppey a few years later by Queen Sexburg. From a charter of privileges granted by King Wihtred and Queen Werburg between 696 and 716, we learn that there were at that time in the province of Kent alone five monasteries governed by lady-abbesses. In Northumbria the Abbess Hild founded a monastery at Hartlepool about the year 647 and another at Whitby a few years later. These monasteries were richly endowed by Oswiu, who sent his daughter Ælflæd to Hild to be educated by her and to become a member of her community. Hild did not confine her educational endeavors to women. Bede, after speaking in the highest terms of the religious discipline maintained at Whitby under Hild, says: "Moreover, her prudence was so great that not only did ordinary persons, but sometimes even kings and princes seek and receive counsel of her in their necessities. She made those who were under her direction give so much time to the reading of the sacred Scriptures and exercise themselves so much in works of righteousness that very many, it appears, could readily be found there who could worthily enter upon the ecclesiastical grade, that is, the service of the altar." Five of her pupils did, in fact, become bishops. Shortly after this time many monasteries for women sprang up in all parts of England. From this time to the middle of the thirteenth century the educational activity of the convents ran parallel to that which obtained in similar institutions on the continent.

Many of the women educated in the convents of western Europe between the sixth and the thirteenth century gave abundant evidence of the thorough training which they had received. Among many others may be mentioned the nun Roswitha, who, in the latter half of the tenth century, attained enduring fame as a poetess and historian. Erbert says of her (*Allgemeine Geschichte der Litteratur des Abendlandes*, 1887): "This fruitful poetic talent which lacks not the inspiration and the courage of genius to enter upon new ground, evinces how the Saxon element was chosen to guide the German nation in the domain of art." Roswitha wrote metrical legends for the edification of the nuns; she wrote contemporary history in metrical form; and composed seven Latin dramas written in the style of Terrence. As an historian, Giesbrecht classes her with Wittikind and Routger, but as a writer of Latin drama in the Middle Ages she stands alone. Herrad, Abbess of Hohenburg in Alsace, gives a glimpse into the artistic activities of the convents of the twelfth century. Few illuminated manuscripts have acquired a fame so well deserved as her *Hortus Deliciarum*, in which she attempted to embody in an encyclopedic work, both in writing and in pictures, the knowledge of her times. The text of this work perished with the library of Strassburg in 1870, but a collection of some 200 pictures copied from it has been preserved. Hildegard of Bingen, 1098–1178, and Elizabeth of Schönau, 1129–1165, are chiefly known through their political writings, which show us the active part that nuns continued to take at this late date in the affairs of the nation. Their writings possess another interest for the student of convent school education, exhibiting as they do the growth of mysticism, which was soon to play so large a rôle in the decline of the educational activities of the nuns.

The convent schools of the Middle Ages reached their highest development about the middle of the thirteenth century, at which time many influences conspired to bring about their gradual decline. From the sixth to the thirteenth century the convents afforded the women of the upper classes a secure shelter from the turbulence of the times. During the Crusades they offered the only safe refuge for the wives and daughters of the knights who were embarking on perilous enterprises with large chances of never returning to their families. With the more settled conditions of the thirteenth century these motives for entering the convent ceased. From this time on an ever-increasing number of the women who entered the convent did so in pursuit of purely religious ideas. The reaction against the rationalism of Abelard (*q.v.*) and the heresies of a somewhat later date resulted in the rapid development of mysticism in the convents. This impulse, which contributed so powerfully to the development of art in all its forms, gradually narrowed the educational horizon of the convent. The rise of the mendicant orders and the religious reforms of the times all tended to bring about a greater seclusion of the nuns and to limit their intercourse with the outer world. The passing of the feudal system and the growth of the townships gave a wide scope to the development of art outside the monastery which heretofore had been its only home. The printing press removed the necessity of copying manuscripts and thus cut off a hitherto powerful stimulus to the educational activity of the convent. In the meanwhile the universities drew to themselves the intellectual men from the world and from the various ranks of the clergy and the religious orders of men. The nuns and women in general were practically excluded from the intellectual life of the university. It is not a matter of surprise, therefore, that the standard of education in the convents gradually deteriorated. It should be remembered, however, that the convents of this period, though not holding their own with the universities, offered the only available schools for women. This phase of the convent schools terminates with the suppression of the convents in England and in Northern Europe in the troublous times following the Protestant Reformation. Convent schools, however, did not cease to exist in Catholic countries. The daughters of English Catholic families in the early days of the Reformation received their education in convent schools on the Continent. During the seventeenth and eighteenth centuries many daughters of non-Catholic families were sent to convent schools where their parents sought to shelter them from the loose manners of the times. This was particularly true in the court circles of France.

The last century witnessed a very rapid development of the convent school. With the spread of popular education, a multitude of teaching communities were called into existence for the express purpose of educating girls. In England the pioneer among the post-Reformation convent schools was Bar Convent at York, founded by Mary Ward in 1688 for the education of English girls of the upper class. For more than a century the penal laws prevented these ladies from assuming religious names or the religious garb. From the year 1790, in which the institution assumed the outward appearance of a convent, the community has grown very rapidly. At the present time it conducts 180 schools in England. A multitude of convent schools grew up in England during the latter half of the nineteenth century. Many of the secondary schools conducted by the various teaching sisterhoods are recognized by the Board of Education and receive support from the State, but many of them, while recognized by the Board of Education, refuse State aid, and they thus retain a greater measure of independence both as regards the admission of pupils and in the regulation of their courses of study. The central purpose of convent school education is the imparting of a thorough religious training, but at the same time it keeps fully abreast with the non-Catholic school in scholastic efficiency. Government inspectors and examiners have frequently borne willing testimony to the excellent scholastic training as well as to the religious atmosphere of the convent schools. Apart from the multitude of parochial schools (*q.v.*) conducted by the teaching sisterhoods, there are at present something over two hundred academies or secondary schools in England conducted by the members of some sixty different teaching communities. There are two training colleges devoted exclusively to the preparation of teachers for secondary schools. The largest of these is St. Mary's Hall, Liverpool, conducted by the Sisters of Notre Dame of Namur; the other at Cavendish Square, London, conducted by the Sisters of the Holy Child Jesus. The sisters of the various communities who teach in the primary Catholic schools of the kingdom for the most part receive their professional training in one of the six recognized Catholic training colleges for primary teachers. The first of these was established in Liverpool by the Sisters of Notre Dame, two of these training schools are conducted by the Sisters of the Sacred Heart, one by the nuns of La Sainte Union, another by the Faithful Companions, and the sixth by the Sisters of Mercy. A certificate of graduation from one of these schools, together with two years' successful teaching in any one school of the Kingdom, entitles the candidate to a certificate from the Board of Education. The convent schools of Ireland and Scotland are on practically the same plane as those of England.

The first convent school established within the present limits of the United States was that founded in New Orleans by the Ursulines from France in the year 1727. The French government subsidized this school. From a copy of the rule of this community, published in Paris in 1705, it appears that: "The Ursuline order has been instituted, not only for the salvation and perfection of its members, but also in order that these may help and serve their neighbor by the instruction of young girls, whom they must labor to bring up in the fear and love of God, leading them in the way of salvation, teaching them every social and Christian virtue, and preparing them to be a source of edification to others by the practice of these virtues." Concerning the preparation of the teachers, the same rule says: " The principal end of the Ursuline's education being to give a good and solid education to young persons, according to their condition, all the teaching religious ought to prepare themselves in the sciences and arts so as to be always capable of meeting the exigencies and to be thoroughly master of all they may be called upon to teach." The first curriculum of this school in New Orleans included reading, writing, arithmetic, Christian doctrine, and industrial training. The Ursulines employed pupil teachers called "dizainieres." These were selected from among the brightest and best-behaved girls. Their office was to assist the teachers in class work and in the maintenance of discipline. Each pupil teacher was assigned a group of eight or ten children. In this respect the convent school anticipated Lancaster (*q.v.*) by almost a century. The Ursulines also employed special teachers for handwriting, arithmetic, and industrial training. The system of training here outlined is practically that adopted by the various teaching communities who were brought to this country from Europe during the eighteenth century or were founded here with a view to meeting the special needs of American girls. The novitiates of these orders constituted the first training schools for teachers in the United States, some of them antedating by twenty years the first public normal school. At the present time there are in the United States more than a hundred distinct teaching orders of women, and if the independent foundations of some of these orders, such as the Visitandines, Ursulines, Dominicans, Franciscans, Sisters of Mercy, and Sisters of Charity be counted, the number reaches some 300. The official directory, January, 1910, gives the number of academies conducted by sisters in the United States as 709. Among the pupils of these schools there are a great many non-Catholic girls. The course given in the secular branches, in most instances, is equivalent to that given in a first-class high school, with the addition of religious instruction and a training in domestic occupations. Within the last few years a number of these communities have established colleges which maintain a high academic standard. In the novitiate schools of the various teaching orders the teachers for both the parochial schools and the academies receive their professional training.

In its general purpose the convent school expresses the idea that beyond a certain age girls should be educated apart from boys. This is the traditional practice of the Catholic Church, and it is in keeping with the principle that education must conform to natural requirements. Neither the arguments in favor of coeducation nor the results which it has produced have so far outweighed the reasons on which the convent school is based. The same reasons, of course, are emphasized in those non-Catholic academies and colleges which provide separate education for girls, however closely they follow the courses and methods of instruction which are pursued in colleges for men. As a special feature, the convent school implies that the student shall reside, during the academic year, within the institution, and shall observe the rules which it prescribes. It is considered advantageous that girls should live under a discipline adapted to their mental and physical needs, with a well-defined series of occupations and a proper distribution of time that secures regular hours for study and recreation. It is, in particular, desirable that the student be withdrawn from distracting influences and trained in those habits of concentration which are essential to intellectual work. Still greater importance is attached to the development of those virtues which form the moral strength and beauty of Christian womanhood, and the best preparation for the duties incumbent on wife and mother. While residence in the convent is a safeguard, the example of teachers whose lives are consecrated to God's service acts as a constant stimulus to moral endeavor. It is chiefly, however, through the knowledge of religious truth which permeates the entire course of instruction and through the regular practice of religious duties that the convent school performs its educational function. So far as it is successful in this respect, it imparts to its students a delicacy of feeling and a firmness in right-doing which, along with mental culture, are the purest sources of woman's influence for good in the home and in the social sphere. T. E. S.

See Middle Ages, Education in; Monastic Rules, Educational Provisions in; Monastic Schools; Parochial School System; Religious Teaching Orders.

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CONVENTIONS, SCHOOL BOARD. — A term employed with increasing frequency in recent years to signify the periodical (usually annual) gatherings of the members and officers of local boards of education for conference and instruction upon matters pertaining to the general administration, welfare, and progress of public schools. In its narrower application the term has lately come to be restricted to those meetings for the organization and the holding of which special legal provisions have been made in several states. Up to the present time nine states, Idaho (1909), Michigan (1909), Minnesota (1903), North Dakota (1903), Oregon (1907), Pennsylvania (1903), South Dakota (1901), Washington (1907), and Wisconsin (1905), authorize the county superintendent of schools, or corresponding officer, to hold at some central point an annual meeting of the members and officers of district and other school boards in the county. While in some instances attendance is voluntary, the tendency has been to require each board to send at least one representative. The more significant of these laws contain provisions for a per diem compensation and mileage. The meetings usually continue for one or two days, and are devoted to general discussion of matters and problems of local moment.

The high degree of decentralization characteristic of the administrative control of elementary and secondary public education in the majority of American states has caused the local boards of laymen to become determining and dominating factors. This is especially the case in the rural sections of those Western and Northern states in which the district, having a board of from three to five members, is the unit for educational administration. Under such circumstances the total number of lay school officials becomes abnormally large and frequently exceeds the total number of teachers in the state. In the absence of continuous and expert professional supervision the efficiency of the school is largely a matter of the efficiency of the lay board. These school board conventions become, as it were, agencies for the unification of educational effort and schools of instruction for laymen charged with the powers and responsibilities of local educational administration. The county superintendent of schools has generally the immediate oversight of the convention, while the state superintendent of public instruction exercises a general influence in directing subjects for discussion. Experience has shown that these conventions have resulted in a broader interest, a sounder knowledge of educational issues, and a higher sense of official responsibility on the part of laymen.

In addition to these conventions, voluntary independent associations of the members of local boards of school control, organized, and meeting at stated intervals, for the purposes of stimulating discussion and of promoting efficiency in the lay administration of education, are not uncommon. In a number of instances state associations of this character exist (*e.g.* Ohio, Maryland); in others, county or district associations have been formed (*e.g.* New Jersey). Not infrequently these associations are affiliated with, or are integral parts of, state or local teachers' associations. E. C. E.

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CONVERGENCE. — That position of the two lines of regard (*q.v.*) of the eyes in which they meet in a single point in front of the eyes. Also applied to the sensory-motor processes by which such a position is attained. The point referred to is called the fixation point. (See Fixation.) Movements of the eyes from a more distant to a nearer fixation point involve an increase, and, from a nearer to a more distant point, a decrease in convergence. Convergent eye movements (which are symmetrical movements) may occur along with asymmetrical binocular movements, in order to fixate, without movement of the head, points in peripheral portions of the field of regard (*q.v.*). R. P. A.

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CONVERGENT ASSOCIATION. — Whenever a system of ideas is so organized that they tend to bring the mind back to a single central principle or idea, all of the associations are said to converge upon this one idea, and the whole system is said to constitute a system of convergent associations. The principles of correlation (*q.v.*) and concentration (*q.v.*) of studies emphasize in a practical way the importance of these convergent associations as distinguished from divergent associations.

See Analogy; Association.

CONVERSATIONAL METHOD. — A method of teaching through conversation: (1) An oral method, representing a reaction against the previous method of conducting class exercises by means of formal questions and answers in favor of a more natural and sociable manner of teaching. In this sense it is much used in the teaching of the so-called content subjects (*q.v.*), such as nature study, geography, etc., the conversational lesson being a means of reporting, comparing, and organizing the results of observation and readings. Conversational lessons are frequently utilized in the so-called formal subjects, such as composition, beginning reading, spelling, as a means of giving a content basis preliminary to developing the technical or formal elements in writing, reading, and spelling. (2) This method as applied to the teaching of foreign languages implies an effort to teach a foreign language nearer to the manner of acquiring the vernacular. The spoken language, mainly through conversation about familiar objects, is made the basis of reading. In other cases such conversational work is a mere supplement to grammatical work and reading. H. S.

See COMPOSITION; ENGLISH LANGUAGE, TEACHING OF; MODERN LANGUAGES, TEACHING OF.

CONVERSE COLLEGE, SPARTANBURG, S.C — An institution for the higher education of women, opened in 1890. Collegiate, musical, and fine arts departments are maintained. Students are admitted to the college courses which lead to degrees either by certificate from an accredited high school or by examination. There is a faculty of twenty-four.

CONVEYANCE OF CHILDREN TO SCHOOL. — See CONSOLIDATION OF SCHOOLS.

CONVOCATION. — An assembly at the English universities with various powers of legislation and recommendation in matters concerning the universities. At Oxford and Durham universities convocation consists of all officials and all graduates holding degrees of doctor and master in any faculty and of Bachelors of Divinity, who have kept their names on the college books, that is, have paid the statutory fees. The convocations at these universities have power to legislate and must be consulted whenever decrees or statutes are to be revoked or altered. At Cambridge University the composition and duties of the Senate are similar to those of the convocations at Oxford and Durham. At the newer universities convocation consists of the officers of the universities and registered graduates who have paid the necessary fees; usually graduates are not eligible until three years after taking their first degree. Convocations here have only the power of making recommendations and expressing opinions on any matter affecting the university to the smaller legislative council or senate or court, and of electing the chancellor and representatives to the legislative assemblies. While the latter type of convocation is a medium for retaining the interest of graduates in the progress and welfare of their *alma mater*, the danger is avoided of submitting legislation to a large and cumbersome body of members who are often out of touch with the changing needs of the modern university and who more often than not exercise their votes in the interests of reaction, as at Oxford and Cambridge. At the same time the legislative body, whatever its title may be in the different universities, is small and has the benefit of the recommendations of the graduate body, which it may reject or accept, as the case demands.

See CAMBRIDGE; OXFORD; UNIVERSITIES.

CONVULSION OR FIT. — An involuntary hyperkinetic or increased motility condition closely associated in a physiological way with spasms and with tremors. When the movements are of parts of members, or of independent small groups of muscles, or of parts of muscles, and not forcible, they are called tremors; when a muscle or group of muscles contracts unconsciously and forcibly, the condition is called a spasm; and when the spasms are repeated and are widespread, they are called a convulsion. In a convulsion, the movements may be long-continued contractions, in which case the convulsion is called tonic; or there may be alternate contractions and relaxations, in which case the convulsion is called clonic. Many convulsions are of a mixed character, and in some there are found distinct clonic and tonic phases.

Convulsions are found as a symptom in a variety of nervous diseases; they may result from the action of certain poisons or from other kinds of irritation to the nervous system. Uremia, anemia of the cerebrum, cerebral hemorrhage, and the excitation of the cerebral cortex by a spicule of bone are very different causes, but all produce convulsions of a similar nature, and of a type difficult or impossible to distinguish from those produced by the action of strychnine, or of absinthe, and resembling those found in epilepsy (*q.v.*). Any long-continued irritation of the nervous system may produce convulsions. We may note as examples, on the peripheral side, the pain irritation from erupting teeth and the long-continued gastro-intestinal disturbances in children; in the spinal cord, poisons like strychnine; and in the cerebrum, drugs like cocaine and carbolic acid, and autotoxins formed in certain diseases, *e.g.* tetanus and hydrophobia.

Convulsions of cerebral origin are often preceded by a peculiar sensation, vague feeling, or bodily warning, called an *aura*. This accompaniment of convulsion is frequently found in the so-called idiopathic epilepsies, and is often sufficiently antecedent to the convulsion to enable the sufferer to seek a suitable place in which he may lie down. At times convulsions are accompanied by partial or total loss of consciousness, by absence of voluntary control, and by loss of control of certain reflexes, such as those of the bladder and rectum. Certain convulsions are known to start in a group of muscles and to extend first to those most closely related, and finally to those all over the body. In others, the whole body appears to be thrown into movement at once. These characteristics are important to note, that the physician may be able to make a proper diagnosis and to analyze the causative factors. The movements of the jaws, tongue, and cheeks churn the saliva in the mouth and frequently produce a frothing, which, if the tongue has been bitten, is stained with blood. The special type of convulsion due to cold, or to the feeling of cold, is given the name "chill." This kind of convulsion is normally found in patients with malaria, who feel cold, but who have a distinct rise in temperature (fever). S. I. F.

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COOKERY. — See Domestic Science; Household Arts.

COOPER COLLEGE, STERLING, KAN. — Founded in 1881, under the auspices of the Synod of Kansas of the United Presbyterian Church. It is a coeducational institution, maintaining preparatory, collegiate, normal, and musical and arts departments. Students are admitted to the college by either examination or graduation from an accredited high school. The normal course leads to the state certificate. There is a faculty of eighteen.

COOPER, MYLES (1735–1785). — Educator; born in England and educated at the University of Oxford. For two years he was a fellow in Queen's College. He accepted a professorship in Columbia College (then King's) in 1762, and a year later was made president. In 1774, he was accused of the authorship of a pamphlet which contained outspoken loyalist sentiments, and he fled to England to escape mob violence. He was subsequently a preacher at Oxford. W. S. M.

COOPER-POUCHER, MATILDA S. (1839–1900). — A teacher for forty-four years in the Oswego normal school; was educated in the public schools of New York State, and at the Albany normal school. She was associated with Dr. Sheldon in the Oswego normal school from its inception to the time of her death. W. S. M.

COOPER, THOMAS (1759–1839). — Educator, graduated from the University of Oxford (England), 1781. He came to America with Joseph Priestley (*q.v.*) in 1794, and was professor of chemistry at Dickinson College and the University of Pennsylvania. He subsequently became president of the University of South Carolina. Author of textbooks on chemistry and political economy. W. S. M.

COOPER UNION. — An educational institution, established in 1859, for the advancement of science and art, by Peter Cooper, a foremost citizen, philanthropist, and merchant of New York. From the first, the most important work of the institution has been performed through its evening classes, in which 142,158 students were enrolled during the first fifty years of its existence. The evening courses at present represented in the institution include a five-year course in general science, a five-year course in chemistry, a four-year course in electrical engineering, and courses of shorter length in mechanical, architectural, and freehand drawing, decorative design, and clay modeling. The so-called course in general science, which has been in operation since 1864, is a distinctive feature of the institution. This course, which draws ambitious and strong-purposed young men from the drafting rooms, engineering offices, and shops of the city, has gradually become a course in the fundamentals of mechanical and civil engineering, embracing instruction in mathematics, science, drawing, and technology, and requiring attendance for four or five evenings a week for a period of five years. The enrollment in the fifth year of this course is about 50 per cent of that in the first year. During the fifty years of its existence, it has graduated some 793 students, many of whom now fill positions of much responsibility in various lines of engineering, business, and manufacture. A Day Technical School has been maintained since 1900. The four-year course embraces instruction in mathematics, science, and technology, and affords training in civil, mechanical, and electrical engineering. The Woman's Art School for instruction in the arts of design, has been a feature of the institution since its foundation. In addition, day courses in stenography and telegraphy are maintained. The enrollment for the year 1909–1910 was 2524 in the evening courses, and 626 in the day courses. A free public library, especially strong in technical and art works, is maintained by the Union, as well as a museum of decorative art, containing very valuable and comprehensive collections. All instruction at Cooper Union is free. The budget for the year ending July 1, 1910, was $166,395. The institution is mainly supported by endowment funds amounting to $2,797,727.67. Charles R. Richards, B.S., is director. C. R. R.

COÖPERATIVE HOLIDAYS ASSOCIATION, ENGLAND. — An association "which offers a cheap and healthy holiday on simple lines combining all physical and intellectual enjoyment." The movement is distinguished from the Chautauqua Movement (*q.v.*) in America by the fact that it aims to reach those who work in the mills, in the shops and stores, and that more emphasis is placed on healthy physical recreation than upon intellectual improvement. It arose out of a rambling club organized in 1887 by Mr. T. A. Leonard, the present secretary of the Association, and at that time pastor of the Congregational church at Colne, Lancashire. The chief aim then was to teach the working classes of Lancashire how to spend their leisure time. Out of the rambles grew a week-end holiday in the Lake District, spent in healthy walking amid some of the finest scenery that England has to offer, with intervals devoted to inspiring addresses —a strange contrast to the hustling, roystering crowds herded together in lodging houses amid the dust and noise of "towns by the sea." Gradually longer holidays were taken; women were admitted as well as men; members of all denominations were welcomed. In 1896 the sphere of work was further extended by affiliation with the National Home Reading Union (*q.v.*). In 1897, under the influence of Dr. Paton of Nottingham, the pioneer in the N.H. R.U. movement, a company was formed, under the title of the Coöperative Holiday Association; to rent, and later to purchase, guestnouses. The dividend is limited to 5 per cent. Thirteen centers are now maintained in Great Britain and Ireland, France, Germany, and Switzerland, some open only in summer and autumn, others throughout the year. A large part of the work of management is voluntary. At each center there are a secretary, hostesses, and lecturers, and a paid manageress who looks after the culinary and service departments. The problem of domestic help has been solved in two ways: in some centers the guests perform their share of service; in others helpers are engaged at fair wages, and after their work is done they mingle with the other guests. At the center the greater part of the day is spent in rambles under guidance of men who have a strong interest in nature study and natural history and understand the beauties of nature. The evenings are devoted to lectures, music, or games. At some centers short summer schools of one or two weeks' duration are maintained; last year series of lectures were given in geology and music at two centers. Simplicity, cheapness, self-help, and comradeship are among the aims of the Association. The great end to be attained is to teach the town worker how to spend his holidays rationally to the benefit of his mind and body. For the present, in spite of limited accommodations, the Association succeeds in reaching about 10,000 men and women each year. An outcome of the Association has been the formation of rambling clubs throughout the country. A magazine, *Comradeship*, is issued monthly as the organ of the Association, in connection with the National Home Reading Union. The central offices are in Manchester.

COÖRDINATION, PSYCHOLOGICAL. — The numerous muscles of the arm must contract in a certain sequence and with graded intensities, if the arm is to move through space and reach its goal with precision. That the trained arm is capable of movement with precision is due to the distribution of motor impulses properly timed and graded in intensity. The nerve centers must develop inner connections in order to send out these motor impulses. When such inner connections are developed, the centers are said to be coördinating centers, and the muscles are said to be coördinated. An example of muscular coördination appears in the ability of the trained penman to move his thumb, forefinger, and middle finger in such a way as to form letters without mutual interference. The term "coördination" as thus exemplified in trained muscular activity is capable of application to more elaborate functions. Conduct may be well coördinated when its elements are harmoniously organized to attain certain ends. Thought processes may be well coördinated. All these processes depend on a highly organized nervous center wherein the impulses are properly related so as to produce efficient results. The goal of education can be very properly described as the coördination of all the individual's functions.

C. H. J.

For coördination as a method of teaching, see CONCENTRATION. See also DIFFUSION.

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JUDD, C. H. *Genetic Psychology for Teachers.* (New York, 1903.)

COÖRDINATION OF HOME AND SCHOOL. — See FAMILY, EDUCATION IN THE; PARENTS AND THE SCHOOL.

COOTE, EDMUND. — An English schoolmaster of the first half of the seventeenth century. After being educated at Cambridge, he became headmaster of the grammar school at Bury St. Edmunds. He was the author of a most popular grammar intended for beginners. The book was entitled, *The English Schole-Maister, Teaching all his Scholars of what age soever the most easie, short and perfect order of distinct Reading and true Writing our English tongue, that hath ever been known or published by any.* The book had reached its forty-second edition in 1684, and was recommended by Brinsley (*q.v.*) and Hoole (*q.v.*). Not only does the book contain the alphabet and spelling lessons, but a short catechism, some psalms, a chronology, and a few pages on arithmetic. The *English Schoolmaster* is an important contribution not only to a knowledge of the method of teaching reading at the period, but of the contemporary elementary, petty, or dame schools. The book makes a special appeal to "such men and women of trade as tailors, weavers, shopkeepers, seamsters, and such others as have undertaken the charge of teaching others. . . . Thou mayst sit on thy shop board, at thy books, or thy needle, and never hinder any work to hear thy scholars." The manual contains a well known "school code" in nine stanzas addressed by *The Schoolmaster to his Scholars.*

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COPPÉE, HENRY (1821–1895). — Educator; graduated from Yale in 1839 and the West Point Military Academy in 1845. He was eight years instructor at West Point, thirty years professor at Lehigh University, and nine years (1866–1875) president of the latter institution. Author of textbooks on logic, rhetoric and English literature. W. S. M.

COPYBOOK. — A book used in the teaching of penmanship in which copies are printed or written as models for the imitation of learners.

See PENMANSHIP, TEACHING OF.

COPYING. — The method of copying or transcription is sometimes used in the teaching of spelling and composition, and in the memorization of literary selections. The method is used on the assumption that the motor accompaniment of writing in the process of copying helps to fix the spelling or literary form, as the case may be. The worth of the method depends largely upon concrete conditions. The pupil may or may not copy mechanically, he may or may not have his attention on all the elements necessary to right learning, — to the meaning, the sound, etc., as well as to the written form. The practice of writing words, once misspelled, a hundred times, from a copy of the correct spelling set by the teacher, is an instance of the ease with which the method of copying is applied in a mechanical way, with resulting failure.

See MEMORIZATION; SPELLING, TEACHING OF.

COPY SETTING. — A term used when the teacher writes or sets the copy, model, or example of penmanship which is to be transcribed and practiced by the pupils. Sometimes one copy is set upon the blackboard to be copied by all; at other times the teacher sets the copy on long slips of paper which are distributed to the pupils, each of whom practices and corrects his work by the copy or model on the slip.

CORD WORK. — See HOUSEHOLD ARTS.

CORDERIUS, MATURINUS, or CORDIER, MATURIN (1479–1564). — A French Protestant, at one time a teacher, and later a follower of Calvin. He was one of the most devoted schoolmasters of the period. In 1527 he resigned the chair of rhetoric in the Collège de la Marche to teach grammar in a school in order to evolve a good method for the teaching of Latin. The result of this work was the book *De Corrupti Sermonis Emendatione Libellus* (*A book for the purification of corrupt speech*). In this he builds up a knowledge of Latin after using the vernacular as an aid in teaching beginners. At the age of forty-four he resigned a professorship at the Collège de la Rive in Geneva, in order to devote himself to teaching the lower forms, which he considered as deserving greater attention than they received. His fame rests on the *Colloquia*, or *Dialogues*, which he published in 1564, and which at once became established as a school textbook. (The full title of the work deserves notice: *Colloquiorum Scholasticorum, libri IV ad pueros in Sermone Latino paulatim exercendos recogniti.*) The work enjoyed as great a popularity as the *Colloquies* of Erasmus. They are marked as much by the attention paid to the training in citizenship, religion, and morals, as by the selection of topics of immediate interest to boys. Both Brinsley (*q.v.*) about 1612 and Hoole (*q.v.*) in 1657 translated the *Colloquies.* Several other translations continued to appear until the beginning of the nineteenth century. The work, especially in the form of *Select Centuries*, was used in schools in England until about 1840.

See articles on CALVINISM AND EDUCATION; COLLOQUIES.

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CORDOBA, UNIVERSITY OF. — See ARGENTINE REPUBLIC, EDUCATION IN THE.

COREA, EDUCATION IN. — See JAPAN, EDUCATION IN.

CORK, UNIVERSITY COLLEGE. — See NATIONAL UNIVERSITY OF IRELAND.

CORNELL COLLEGE, MOUNT VERNON, IA. — Founded in 1853 as the Iowa Conference Seminary; present title obtained by charter in 1857. It is a coeducational institution under the patronage of the Methodist Episcopal Church. Academic, collegiate, commercial, and fine arts departments are maintained. Fifteen units of high school work are required for admission to the freshman year in college. Students are admitted either by examination or on a certificate from an accredited high school. The courses which are offered in the college lead to the degrees of B. A., B. S., and B. S. in Civil Engineering. Students who complete a course in education receive a first-class five years' state certificate without examination. In 1910–11 there were 741 students enrolled in the college. There is a faculty of twenty-three professors and nineteen instructors and assistants.

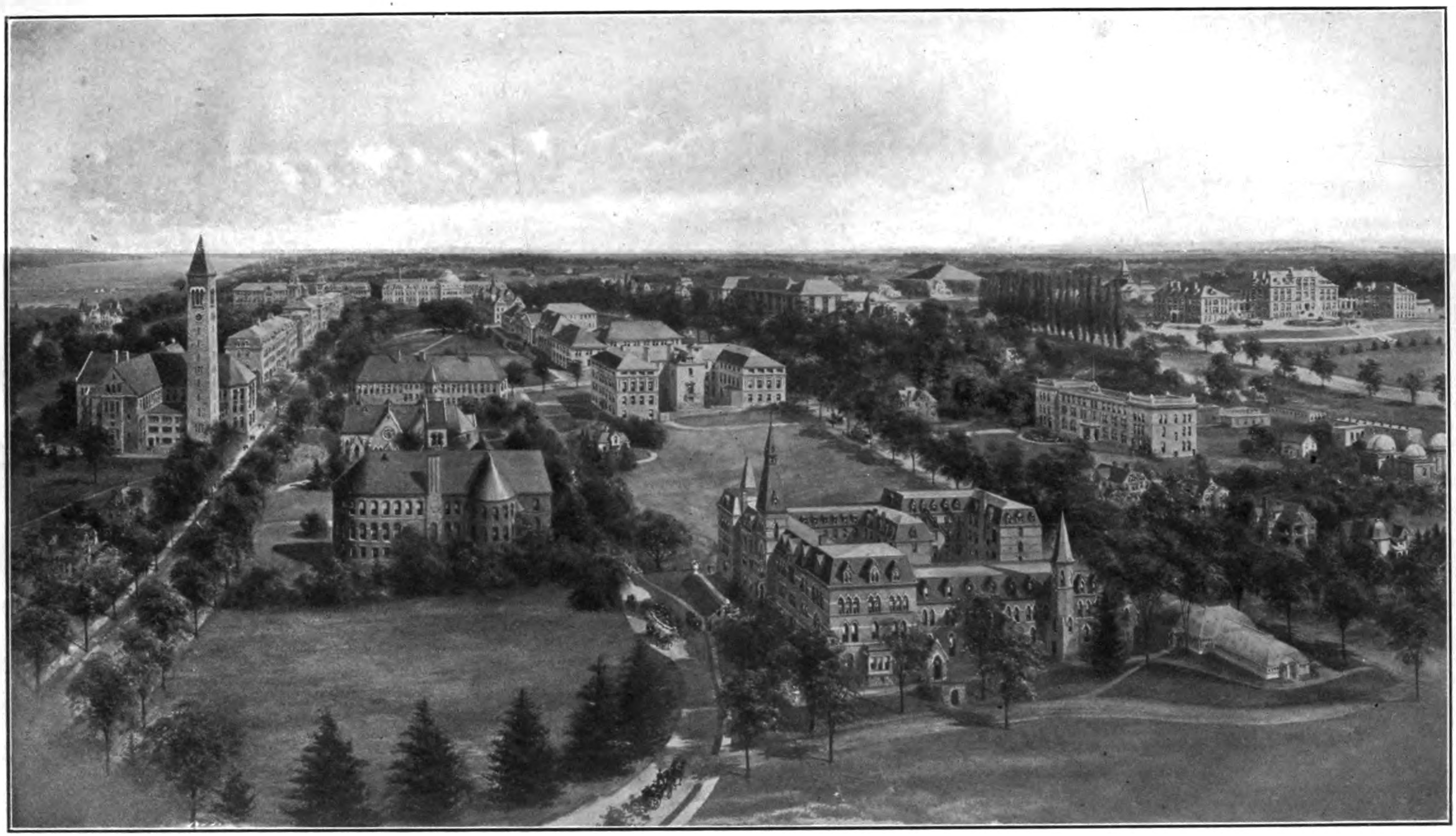
CORNELL, EZRA (1807–1874). — The founder of Cornell University (*q.v.*); born at

Westchester Landing, N.Y., on the 11th of January, 1807. He received his education in the common schools and in business life. Besides an active business career, he served for several terms in the legislature of New York. He founded the Cornell Free Library at Ithaca, N.Y., in 1863, and two years later he founded the university that bears his name. He died on the 9th of December, 1874. W. S. M.

CORNELL UNIVERSITY, ITHACA, N.Y. — One of the most recent of the great non-state universities, incorporated in 1865 and opened in 1868. The opening of Cornell marked a new era in the history of higher education in America, illustrating as it did that the university can maintain high scholastic and cultural ideals while at the same time meeting modern needs and requirements. The establishment of the university was made possible through the sagacity and far-sighted administrative ability of Ezra Cornell. A practical man in intimate touch with the scientific requirements demanded by the rapid progress of his day, he saw the need of trained and practical scientists. He himself had amassed a large fortune, and he wished to found an institution where any person could find instruction in any study. As one of the trustees of the State Agricultural College at Ovid he was impressed with the importance of providing instruction in agricultural and mechanical arts. When Congress made the land grants under the Morrill Acts (*q.v.*) Cornell proposed that an institution carrying out the objects of the grants should be established at Ithaca for which he would provide the land, building, and equipment, if the land grant were transferred to this institution. After considerable political agitation, since there was a contemporary proposal to divide the grant, Cornell's scheme was approved by the New York Legislature in 1865. The charter was drawn up in that year with the assistance of the Hon. Andrew D. White, who gave valuable advice on the educational aspects. The aims of the institution are expressed in the words of Cornell: " I would found an institution where any person can find instruction in any study." Hence it was provided that students should be admitted "at the lowest rate of expense consistent with welfare and efficiency." To place the new university on a secure basis Cornell purchased land scrip granted to New York State, and held it until the prices should rise; the profits on the sales were to go to Cornell University. He personally supervised the location of the land in different states. His integrity was attacked by political opponents, but he successfully vindicated himself. His policy to hold the land until a favorable opportunity for selling arose was the means of securing an endowment for the university which assured future progress. In much of his labors he was assisted by H. W. Sage, himself an ardent supporter and patron of the university. Since the state was making some contribution to the funds, it was provided in the charter that it should be represented. The Board of Trustees now includes the Governor, Lieutenant-Governor, Commissioner of Education, the President of the State Agricultural Society, the Commissioner of Agriculture, the Librarian of the Cornell Library, and the President of the University, all *ex officio*, fifteen trustees elected by the board, ten trustees elected by the alumni, and one by the New York State Grange. Further provision was made for the admission of students winning state scholarships.

Under the system which was introduced from the beginning provision was made for non-resident professors who should deliver courses at the university. Among these have been Louis Agassiz, James Russell Lowell, Theodore W. Dwight, and George W. Curtis. In 1868 Professor Goldwin Smith of Oxford, England, who was in full sympathy with a movement which Matthew Arnold thought was opposed to the ideals of culture, was appointed to the chair in English History. Hon. Andrew D. White, LL.D., became the first president of the university, and remained in that position for twenty years, while the young institution was finding a secure foundation. He was succeeded in 1885 by Charles Kendall Adams, who retired in 1892.

The university was opened for work in 1868. It was located at Ithaca, where Cornell already had purchased some land. The campus, which now covers an area of about 1100 acres, is situated in the heart of a most picturesque country. It overlooks Lake Cayuga, and is surrounded by beautiful waterfalls, cascades, and gorges, which have been preserved with great effort as the university gradually expanded. Among the more prominent of the numerous buildings are the University Library, which contains a library of 385,000 volumes, including the Andrew White collection of books bearing on the French Revolution, and the Fiske Dante collection of books and pamphlets; Boardman Hall, Stimson Hall, Sibley College, the Goldwin Smith Hall of Humanities, the Morse Hall of Chemistry, the Rockefeller Hall of Physics, the building of the New York State College of Agriculture, and the Sage Chapel. Although the establishment of the university was facilitated by the Morrill Acts, and the agricultural and engineering departments have developed rapidly, the other studies have not been crowded out, and a strong school in the humanities is maintained. The agricultural department is known as the "New York State College of Agriculture at Cornell University," and stands in intimate relation with the state, which made the erection of buildings possible in 1904. Students in this department who are residents of New York State pay no tuition fees. In addition to the college of agriculture, the university also includes the college of arts and sciences, law, architecture, civil engineering, the New York State Veterinary College, medical college (at New York



Cornell University.

and Ithaca), Sibley College of Mechanical Engineering and Mechanic Arts, and a graduate school. Students are admitted by examination of the university or of the College Entrance Examination Board (*q.v.*) or by certificate from accredited schools. Candidates for admission to the medical college must be either graduates from an approved college or scientific school or seniors in the university. Two courses are offered in law, one of three years and the other of four; candidates for the former are required to have had one year of college work, leading to an A.B. degree. The university is coeducational, special provision being made for the residence of women in the Sage College and Cottage. After an interesting struggle to become established, the fraternities have developed an active life. Besides a large number of local societies, chapters of nearly all the national fraternities have been established at Cornell, as well as four sororities. The Medical College at New York has chapters of Alpha Kappa Kappa, and Omega Upsilon Phi. The students generally live in fraternity and club houses or in private lodgings. The enrollment in 1909–1910 was 4227 students, distributed as follows: graduate department, 309; graduate students in undergraduate courses, 240; arts and sciences, 970; law, 264; medicine, 201; agriculture, 539; veterinary medicine, 100; architecture, 140; civil engineering, 559; mechanical engineering, 1186. In addition there were 987 students in the summer school of 1910. The faculty consisted of 138 professors, 82 assistant professors, 5 lecturers, 210 instructors, and 201 assistants, etc. The net income as reported for 1909–10 was $1,637,299.25. The average salary of full professors is over $3000. Jacob Gould Schurman, A.M., D.Sc., LL.D., is the president.

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Von Engeln, O. D. *At Cornell.* (Ithaca.)

CORNWAILE, JOHN. — A master of grammar at Penkridge in Staffordshire, who was the first to break through the rule that in grammar schools all teaching should be given in the Anglo-Norman dialect, and has been almost certainly identified as a teacher of grammar at Oxford in connection with Merton College in 1347. The part which Cornwaile played in English education is narrated in the article Black Death and Education (*q.v.*).

J. E. G. de M.

CORPORAL PUNISHMENT. — See Punishment, Corporal.

CORPORATION SCHOOL. — See Apprenticeship Education; Factory Schools; Industrial Education.

CORPS. — The name of one type of Student Association in the German universities. They originated at the beginning of the last century out of the *Landsmannschaften* (*q.v.*) and secret orders of the period. These associations are somewhat exclusive; they are bound by a rigorous code of honor and make a strong feature of dueling (*q.v.*) and the *Mensur* or fencing bout. Equality and brotherhood are assumed among all members of all corps. "The corps have always had the reputation of being on the right side politically," although politics play no part in the organizations. The members are recruited from the upper classes of society. The names are taken from different districts of Germany, but the membership of each corps is not restricted by residence qualifications any longer. Since 1853 the *Kösener Senioren-Konvent* has served as a central representative. body of all the corps. The *Akademische Monatsheft* is the organ of these associations.

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Stammbuch des Studenten (frequent editions by various editors and publishers).

CORRECTION, HOUSE OF. — The institutions to which this term is applied are not commonly educational, as might be inferred. It is applied to a variety of institutions for adults whose offenses are not felonies. Vagrants, drunkards, and deserting husbands are most commonly assigned to houses of correction, partly with the idea of obviating some of the moral effects which would follow commitment to a jail or prison, and partly in the belief that a term in the house of correction will tend to make the offender reform and lead a better life. It is agreed by penologists that the educational aspect of the institution has not yet been developed.

See Correctional Education; Penology, Educational Aspect of.

CORRECTION OF ERRORS, METHODS OF. — Teaching methods may be grouped into two classes as they deal with two differing mental situations. One class of methods aims primarily to extend the power of the child over new facts, relations, forms, conventions, etc.; another group is primarily designed to correct the misinterpretation of facts and the misuse of forms, symbols, etc. In the first instance successful teaching proceeds from ignorance to knowledge, in the second from error to knowledge. The first situation is uncomplicated, and the method of its treatment is direct and constructive. The second situation is complex, as there are facts and connections established in an erroneous manner. Here, the method aims at the modification of an old series of associations, or at its elimination and the substitution of a new series. In a general sense, methods of this second class are spoken of as "methods for the correction of errors." In current usage the phrase is more frequently applied to that narrower and more specialized group of methods employed in the correction of purely formal errors, or errors of convention, as in the correction of mistakes in spelling, language, arithmetic, and other so-called "formal subjects."

Too frequently the methods of correcting language and other errors are inadequate. They do not involve a sufficiently varied or continued treatment. A sound psychological method would distinguish three distinct stages in the correction of errors in linguistic habit. (1) The error or variation from established usage must be sensed by the child. This may be done by calling the error to his attention deliberately or by sensitizing him to the possibility of error when there is a conflict between his own usage and that of others. (2) The right form must become known to the child, and clearly comprehended by him. There are a number of ways by which this may be done. The teacher may simply tell him the correct usage, he may find it himself by reference to the dictionary or grammatical rules, or he may gather it from usage itself. (3) The knowledge of the right form must be converted into a practiced and habitual use that permits no lapses into the previous error. Continuous reimpression of the right form in connection with the idea of its meaning is necessary here. This last stage of treatment requires considerable time and effort, which most teachers and parents do not give. Even after the teacher's efforts to habituate the new usage have commenced, the child will continue to use the old and incorrect form in the spontaneous speech of his everyday life outside the schoolroom. Later he will use the wrong and the right forms interchangeably. This is the promising period. If the teacher's efforts are still maintained, the correct form will become dominant, and the error stand corrected.

Owing to the influence of bad example and the constant practice of wrong habits which the natural life of the child affords, the school works at a disadvantage in the correction of errors. In order to compete, the school should center its efforts on the most important errors, letting the minor ones go for the time being. As children write less than they speak outside of the classroom, errors peculiar to written language, such as capitalization and punctuation, may be corrected more rapidly than those of oral expression. Only a single correct form should be brought into competition with an incorrect usage for the time being. The possession of one accurate form should take precedence over versatility in speech. A controversy exists as to whether errors of language should be corrected as soon as they occur, or brought to attention later. On the basis of what has been said of the stages in the correction of errors, it is apparent that complete correction cannot be achieved merely through a momentary interruption of speech for the purpose of calling the attention of the student to his mistake. Such treatment leaves much to be done later, and only breaks the thread of thought. The method of immediate correction would seem less useful as the children are young and lack self-command.

There is a considerable difference between correction by the teacher and self-correction. In the first case, the teacher may note the wrong usage, provide the right one, and conduct the exercise that will lead to a new habit. In the second case the child himself must discover his own error through his quick sensitiveness to the difference between his own and another's speech; he must be able to consult authoritative works and determine the right and wrong of usage; and finally he must have the initiative and persistence to drill himself in the right form. The school must use both methods, that of correction by the teacher and that of self-correction, inasmuch as they are supplementary. H. S.

See Methods, Teaching; Types of Teaching.

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CORRECTIONAL EDUCATION. — The progress of social economy during the nineteenth century differentiated many aspects of dealing with the delinquent or prospectively delinquent. Out of the science of penology, (*q.v.*) came the study of reformatory education, and the system of public schools developed parental schools, truant schools, and disciplinary schools. The aim of the various types of education here considered is correctional, that is, it aims to correct the bad habits, vicious knowledge, or wrong predispositions already formed in the bad environment or possibly in connection with an unfortunate heredity, and in accordance with the age and circumstances of the pupil to make of him, by special educational methods, a better citizen. Reformatory education (*q.v.*) commonly deals with first offenders and others of an age ranging from sixteen to twenty-five. These must be confined in essentially prisonlike institutions and be committed through due process of law. The education becomes increasingly industrial in character, and a system of indeterminate sentence coupled with release on parole has complicated and rendered the entire system more efficient.

Reform schools (*q.v.*) are designed to receive legally committed offenders under the age of sixteen, and usually do not keep these beyond eighteen. Here again the education is industrial in character, with especially strong moral features. Owing to better means of control, these schools tend less to resemble prisons.

Parental Schools (*q.v.*) are boarding schools like reform schools, and their inmates are usually of the same age and general characteristics, but their commitment is due to habitual truancy and their incorrigibility in the school sense.

Truant Schools (*q.v.*) are sometimes parental schools under another name and sometimes day schools in which the truant is set apart for special educational treatment. Disciplinary classes (*q.v.*) are special or ungraded schools formed within the ordinary public school, and design and make possible the special treatment of boys and girls who are hard to discipline in the ordinary schools. These are yet experimental in character.

Special modifications of the above forms are found. Reform schools, receiving children under fourteen and not technically criminal, exist to some extent under philanthropy. Special industrial schools for negroes present peculiar problems, partly in view of the fact that most of those committed are usually the victims of neglect. A number of states and philanthropic bodies maintain special industrial or reform schools for girls. A few juvenile reform schools under private direction have become self-governing communities. A special form of day truant school is found in English cities, in which the children, usually those whose parents both work, stay in the school the entire day and return home only when the parents have arrived from work. (See INDUSTRIAL SCHOOLS.) Houses of correction are usually short-term prisons and do not employ educational methods in the sense above implied, but it must be noted that the science of penology is to an increasing extent becoming an educational science, in that reformation, more than punishment for its deterrent effect, is to an increasing extent the controlling aim.

Various phases of correctional education will be treated under the heads above mentioned.

D. S.

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DUTTON and SNEDDEN. *Administration of Public Education in the United States.* (New York, 1908.) See ch. xxiv and the references there given.

CORRECTIVE METHODS. — Any methods primarily intended for the correction of knowledge or conduct. In the use of "corrective" methods, the error or wrong is assumed to exist. Corrective methods are usually contrasted with "preventive" methods, where the intent is to safeguard against a specific fault likely to arise. Where "corrective" methods are applied to conduct, they are frequently termed "correctional" methods, hence "correctional institutions," "houses of correction," etc.

H. S.

See CORRECTION OF ERRORS, METHODS OF; PREVENTIVE METHODS; METHODS, TEACHING; TYPES OF TEACHING.

CORRELATION. — As applied to the work of education, this means the interrelation of studies so that the material of each lesson is made interesting and intelligible through its connection with the points involved in others. In general three reasons for correlation have been urged. First, correlation enables the child to comprehend better the meaning and bearings of what he studies. The more thorough the correlation, the richer the intension of the ideas that are presented. Without correlation study is irrational, wooden. It becomes a mere appeal to mechanical memory. The proper interrelation of the material of instruction makes it intelligible, more easily memorized and retained, and more significant. Second, correlation is held to make study interesting, for it connects the work of the lesson with what the child already knows and is interested in. To find in the new the familiar is ever a source of pleasure. To be able to unravel, explain, perhaps anticipate the work of the new lesson, as a result of applying what is already learned, is a power the exercise of which is a continual delight to the pupil. Third, correlation makes the application of the knowledge gained in school to practice both within and without that environment far more easy, and so far more likely. This result is due, first to the fact that it cultivates in the child the tendency to apply his knowledge to the comprehension of new ideas and the solution of new problems and second to the enhanced power of recall that springs from the many associations which it establishes. To be able to apply knowledge, one must be accustomed to the practice of hunting within himself for ideas with which to deal with new situations, and the experience that he has already obtained must readily rise into memory when it is needed. Correlation cultivates the tendency to think, and facilitates the recall of resources to sustain the thinking process. The general conception of correlation is applied to the work of the school in a great variety of ways. These types of correlation may be reduced to three groups: (1) correlation within the content of a subject; (2) correlation among the different subjects in the course of study; (3) correlation between the school work and life outside.

1. The correlation of the material of a subject means, of course, that arrangement by which each topic is a natural outcome of the preceding one and a natural preparation for the next. It is the grading of the subject matter. Grading may follow either what is known as the logical order or the so-called psychological

order. The logical order implies any systematic development of the subject from premises to a logical conclusion. The psychological order implies such an arrangement as appeals to the child's interests and powers of comprehension. The psychological order involves certain logical principles of arrangement, but not all logical arrangement is effective in its psychological appeal. In learning written language, it is logical to begin with the letters. However, it is not a good psychological order to make such a beginning, especially with little children. Until they are combined in words, letters are meaningless, and, as a rule, uninteresting abstractions. The natural, or psychological, first step is to begin with words and sentences, which have meanings and may easily be interesting. The alphabetic method is logical but not psychological; the word method is both.

2. When one speaks of correlation in education, it is ordinarily the second type that is in mind, that is, the interrelation of subjects in the curriculum. Such correlation may be of two sorts, which may be called incidental and systematic. Incidental correlation is that which arises as a result of the broad presentation of a topic to a class. If the teacher is giving a history lesson on the discovery of America by Columbus, and makes use of arithmetic, geometry, geography, natural history, literature, and drawing as a means of developing interest in the class and giving a comprehensive notion of the event, she is employing correlation. Systematic correlation involves such arrangement of the content of the various subjects in the curriculum as makes them constantly bear upon each other. The day's work in arithmetic, for example, is planned, not merely to spring out of the preceding lesson in arithmetic and to lead to the following lesson in that subject, but also to be a natural outcome of the work which has just been done in geography, nature study, constructive work, or perhaps even history and literature, and to prepare for immediate onward progress in all these lines. Incidental correlation arises from day to day, and is a necessity of good teaching; systematic correlation requires a planning out of the whole course of study. Systematic correlation may be minute and specific, or merely general and loose in character. The daily work in each subject may be made to bear on the daily work in correlated ones. The topics may be selected to correspond as closely as possible. For example, the history, the geography, the drawing, the nature study, the arithmetic, the literature and composition might deal with the discovery of America. This would be close correlation. On the other hand, the curriculum may be planned merely to make it likely that when a topic is taken up in a certain subject, the pupil will be in the possession of such knowledge from other subjects as is necessary to its adequate comprehension. Close correlation is apt to become superficial and ridiculous. For example, the topic of the school day might be the egg, which could be studied not only from the point of view of nature study, but as the theme of other lessons. It could be drawn, measured, and weighed. It could be studied as an article of trade in commercial geography. Literature dealing with the egg might be found; if nothing else, then Humpty Dumpty from *Mother Goose* or the tale of the Roc's Egg from the *Arabian Nights*. In history the legend of Columbus and his problem of standing an egg on end might be read. To conclude, the composition work might bear on the same theme. Such close correlation has undoubtedly done much to discredit the idea altogether. The difficulty arises because close correlation seems to demand that the same topics as well as the same principles shall run through the lessons that are studied each day. Indeed, it seems difficult to provide a specific correlation of principles without unity of topics. Now, while the topics of some subjects, such as history and geography, can be fairly easily made to correspond, it is evident that others will not fit so well; for example, natural science and literature. Close correlation usually culminates in a scheme of concentration (*q.v.*) where there is one central subject, for instance, history, which constitutes the core of the curriculum; other subjects are studied only as they contribute to the comprehension of the topic of the day in this central subject, or as they contain topics which can be related to this.

3. The third type of correlation is that between school work and the life outside. Of this we may note three phases, the correlation of school and home, of school and vocation, and of school and the entire present or future outside activity of the pupil. The last sort of correlation includes, of course, both the others, but it also goes beyond them. The correlation of home and school aims primarily at discipline and moral culture. It presents two phases, first the introduction of a home atmosphere into the school, and second the endeavor on the part of the school to secure the assistance of the home in controlling the child and in interesting him in its work. Further results follow from the establishment of cordial relations between the two institutions. These are: (1) The school is able to learn more about the individuality of the pupils by getting the suggestions of the parents and by studying home environments and hereditary traits. (2) The school gets the coöperation of parents not only in discipline, but also in connection with the studies pursued. Hence we have home work, report cards, and similar practices. (3) The school endeavors to transform the home through its educative influence on the children. In this connection the clubs of the school, parents' meetings, etc., are utilized.

The problem of correlating the school with the vocation has led to the rise of vocational schools and the issue of vocational education.

This is discussed in special articles. The idea of relating the school to life in general has involved especially the attempt to transform the school activities so that they should so far as possible resemble the concrete situations in the world at large. The endeavor to bring about this result is one of the leading features of school reform to-day. It has taken the form of attempts to make the school a place of social coöperation rather than of individual learning; to connect theory with practice by causing the child to apply whatever he learns, or to learn through doing, or perhaps merely as an incident to the solution of certain practical problems that arise in the school life; and finally, to make sure that the problems of the school represent typical ones in real life. (See EXPERIMENTAL SCHOOLS.)

The principle of correlation has appeared wherever educational reform has reacted against the isolation and mechanical character of school work. It is especially in evidence in the criticisms of the realists of the seventeenth and eighteenth centuries upon the linguistic instruction in the secondary schools. It was urged that knowledge should be made more practical, that words should be taught only in connection with things, and that living as well as dead languages should receive attention in the schools. Comenius (*q.v.*) especially may be regarded as an advocate of correlation between language and science, school and home, theory and practice. The French reformer, Jacotot (*q.v*), pushed the idea to a somewhat extreme conclusion in his maxim "all is in all," a practical application of which is found in his view that a thorough study of the *Télémaque* of Fénelon would involve a complete education. It is, however, especially to Herbart and his followers that we owe the modern emphasis upon the principle under discussion. His notion of apperception, when applied both to method and to the course of study, meant constant interrelation of the material of instruction. Indeed, his followers interpreted this system and unity to involve concentration. Utilizing certain hints of the master, Ziller (*q.v.*) developed therefrom the plan of instruction, having history as its center and the notion of the culture epochs (*q.v*) as its principle of arrangement. The idea of correlation was made prominent in the United States through the influence of the Herbartians, and the brilliant advocacy of Colonel Parker (*q.v.*). It seized the attention of the teachers in general, and was made the central principle in a proposed reorganization of the secondary school program submitted by the Committee of Ten (*q.v.*), to the National Educational Association in 1894. This was followed by a similar scheme proposed for elementary education by the Committee of Fifteen (*q.v.*) and reported to the same Association in 1895. These schemes have been criticized as not providing genuine correlation, but they mark the point of highest general interest in this specific topic in the United States. It is interesting to note that the committees emphasized especially the disciplinary effect of studies. (See FORMAL DISCIPLINE.) It was assumed that each subject gives a special sort of discipline, that enhances the ability to deal with any subject where similar mental powers are required. Correlation here means the proper organization of these disciplines, so that we have as a result both the highest degree of mutual assistance among the forms of training, and the all-round development of the individual. One of the most recent notable attempts at correlation is that suggested by Professor Dewey for the Experimental School at the University of Chicago. It was essentially a plan for concentration about the social life of the school. E. N. H.

See CONCENTRATION; CULTURE EPOCH; FORMAL DISCIPLINE; FAMILY, EDUCATION IN; etc.

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CORRELATION. — A statement of relationship between two quantities or sets of data.

See GRAPHIC CURVE; STATISTICAL MEASUREMENTS.

CORRELATION, COEFFICIENT OF. — A statistical term referring to a single figure so calculated from the individual records as to give the degree of relationship between two facts which will best account for all the separate cases in the group. It expresses the degree of relationship from which the actual cases might have arisen with least improbability.

See GRAPHIC CURVE; STATISTICAL MEASUREMENTS.

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CORRESPONDENCE SCHOOLS. — As the name indicates, these are educational institutions in which instruction is carried on by correspondence. They differ from the ordinary schools chiefly in the fact that their students, instead of being required to reside at, or near, the institution, and to attend classes for the purpose of receiving oral instruction, are provided by their instructors with written or printed outlines of the course or courses to be pursued, sources of information, suggestions, directions, and questions, and are required to submit reports and answers in writing. The mails are the sole medium of communication between teachers and pupils. Such schools are well calculated to serve those who wish to study under expert direction, either for self-improvement alone, or for any special purpose connected with a trade or calling, and who for any reason are unable to attend the regular sessions of an ordinary school, college, or university. At present there are, in the United States alone, more than two hundred correspondence schools. Some institutions calling themselves correspondence schools are little more than names, others are primarily organizations for the advertisement and sale of textbooks; but there are many which are legitimate educational institutions and provide excellent instruction. Schools of this latter class deserve and receive recognition as effective educational agencies, and their patronage shows an extraordinary demand for the kind of instruction they offer. A single correspondence school of the better class has had an enrollment, during its existence of twenty years, of 1,281,800 students. The teaching organization of this school falls into thirty divisions, and even the subjects of these divisions do not include all the branches in which courses are offered by other institutions of the same kind.

Systematic instruction by correspondence owes its origin to the University Extension movement which began in England in 1868. Soon after that time, an English society was formed for the encouragement of home study. It limited its offer of assistance to the well-to-do, and confined itself chiefly to providing plans of work without correspondence. In 1873 the idea was transplanted to America. In the autumn of that year a society was organized in Boston which called itself a " Society to Encourage Studies at Home," and which added to the plan of the English society regular correspondence with its members. In 1883 a " Correspondence University," consisting of an association of instructors from various colleges and universities, was formed with headquarters at Ithaca, N. Y. The object of this university, as expressed in its announcement, was " to supplement the work of other educational institutions, by instructing persons who from any cause are unable to attend them." Meanwhile, Dr. William R. Harper, then Professor of Hebrew in the Baptist Union Theological Seminary, was offering correspondence courses in Hebrew. Later, at Yale University, he offered additional courses in New Testament Greek and in Biblical Literature and Interpretation. When the University of Chicago was established in 1892, with Dr. Harper as president, teaching by correspondence was adopted as a method of university instruction through the Correspondence Division of the University Extension Department. The first correspondence study student was enrolled in October, 1892, the month in which the university opened. In the year 1908-1909, the number of students enrolled for correspondence study in that institution was 2386. One hundred and thirty-two teachers gave instruction in 335 courses. Other universities, notably Wisconsin, Brown, and Nebraska, were quick to follow the initiative of the University of Chicago. Correspondence study thus had a university origin, and owes its recognition as a legitimate method of university instruction chiefly to Dr. William R. Harper, to whom credit is due also for the inspiration which led to the establishment of the first school based strictly upon the correspondence study idea, namely, the Sprague Correspondence School of Law, organized in 1890 and incorporated in 1891.

It is not to university sources alone, however, that the correspondence schools of to-day owe their idea and their origin. They have another and quite independent parentage. In a daily paper published in Shenandoah in the coal-mining district of eastern Pennsylvania, there was in the eighties a department devoted to the education of miners in the principles of mining and the methods of protecting themselves from the dangers of their calling. Mine foremen were required to pass an examination " in the laws of mine ventilation, safe methods of mining, and the means of controlling dangerous natural phenomena incident to coal-mining." The editor had organized a mining institute with an educational object, and had republished and circulated some of the best foreign books on the prevention of mine accidents. He then conceived the idea of devoting a column of his paper to questions and answers relating to mining. The questions of the Mine Examining Board were stated, explained, and illustrated. A small textbook on coal-mining was published for the use of mine foremen. In 1891 a course covering the subjects of coal-mining, mine-surveying, mine machinery, etc., was prepared and later developed into a complete coal-mining course. In the same year the plan of teaching by correspondence was adopted. From this simple beginning has developed the International Correspondence Schools of Scranton, Pa., with courses in more than two hundred subjects and with students in all civilized countries of the world.

The methods of instruction employed by the various correspondence schools differ in details, but in general they are practically as follows: A syllabus containing, perhaps, an outline of the course to be pursued, with lesson assignments or lesson papers, is sent to the student with special directions in regard to the work to be done. A report upon each lesson, with such questions as the student may desire to ask, is returned to the teacher, who corrects the errors of the report, writes upon it such criticisms and suggestions as he may desire to make, and returns it to the student. The time required for the completion of the course varies with the amount and difficulty of the work to be done. With this description of the method of instruction employed by correspondence schools, it will appear that some subjects lend themselves more readily than others to correspondence study. A course requiring elaborate and expensive apparatus, or the facilities of an extensive library, cannot as well be conducted by correspondence as a course in the common branches, the languages, history, or literature. Many difficulties are overcome by the preparation of textbooks specially designed for correspondence teaching. The necessity imposed upon the student by the correspondence method of instruction of writing all answers to the questions of his instructor, as well as the questions presented by himself, is a distinct advantage over the classroom method, and it is the testimony of many of those engaged in correspondence teaching that the work done by correspondence is even better than that done in the classroom. Hence the correspondence school, both on account of the kind of work it may do, and the large number of persons to whom it brings educational opportunities not otherwise available, is a valuable and permanent agency in the work of education. I. W. H.

CORRESPONDING POINTS. — These are points on the retinæ of the eyes whose impressions unite in binocular vision to give a single perception. All foveal points are thus correspondent, and in general any points of one retina are correspondent to geometrically similar points of the other. Any fixated object (foveal vision) thus yields but a single impression, and any points not fixated, but falling on corresponding points, appear to occupy the same position in relation to the point of fixation. Objects are seen double when they fall on noncorresponding points. Thus, if a finger of one hand is placed before the eyes and one of the other hand a little farther away, and either finger is then fixated, the other appears double. R. P. A.

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CORTEX. — See NERVOUS SYSTEM.

COST OF EDUCATION. — As a general rule reports of cost of education have been almost valueless owing to lack of uniformity over large areas in the details reported or the facts evaluated. A flagrant example of useless reporting of cost of education is the listing of totals. Thus the statement that the cost of common schools in the United States during 1906–7 was $336,898,333, and that the total cost has doubled within fourteen years is both meaningless and misleading, for while the actual expenditure for schools has doubled in this time, the expenditure per pupil in average daily attendance has increased only 52 per cent. To have any significance all statements as to cost must be reduced to relative terms and uniform standards must be adopted throughout the country. For cost of education in America see the articles on the State Systems; see also REPORTS and RECORDS; BUDGET, SCHOOL.

Other Countries. — Owing to the varied standards used by different countries, it is impossible to utilize their statistical material in making more than a rough comparison of expenditures. The types of education vary largely even among different American states. In some cases all forms of current expenditure, including interest on bonds, are included, in other cases these are omitted. In France the payment of teachers' pensions is not reckoned in the cost of education, whereas in Germany it is. Secondary education, which is much more expensive than elementary, begins in European states earlier than in America, and in Germany its cost is always reckoned on a separate basis. For details of the cost of education see under the separate national systems, especially ENGLAND, EDUCATION IN; FRANCE, EDUCATION IN; GERMANY, EDUCATION IN. D. S.

See BUDGET, SCHOOL; CITY SCHOOL ADMINISTRATION; REPORTS AND RECORDS.

COSTA RICA, EDUCATION IN. — The republic of Costa Rica extends over an area of 18,400 square miles occupying the southern part of Central America, and directly united by the Isthmus of Panama with South America. By reason of its position this state has been more directly affected by the events that have made the United States government a controlling power in the affairs of the isthmus than any other division of Central America.

The constitution of Costa Rica, which forms the basis of the present political system, was promulgated in 1870, but has been frequently modified since. It was not until 1882, after a series of dictatorships, that the government really assumed the republican form. The central administration of public affairs is vested in four ministries, or executive departments, under the president of the republic. Public instruction and justice are both included in the ministry of foreign affairs. For local administration the republic is divided into five provinces and two *comarcas* (territories). The latter are Puntarenas, part of the Pacific coast line, and Limon, the whole of the Caribbean coast. The five provinces are as follows: San Juan (capital San José, also capital of the republic); Alajuela (capital Alajuela); Heredia (capital Heredia); Cartago (capital Cartago); Guanacaste (capital Liberia.) The population, as estimated Dec. 31, 1908, was 361,779, including between three and four thousand aborigines. The population of the chief cities and adjacent regions is chiefly of pure Spanish origin or descent. The state religion is Roman Catholic, but the constitution guarantees entire liberty of faith and worship.

At present the government is actively engaged in endeavors to develop the internal resources of the country, to encourage friendly relations with foreign powers, and to improve the social and intellectual condition of the people. These purposes impart new importance to the system of public instruction, which is, theoretically, at least, well organized as a department in the ministry of foreign affairs and justice. The head of the department, at present, Señor Don R. Brenes Mesen, bears the official title of Subsecretario de Estado en el Despacho de Instrucción Pública. The secretary is assisted by a Council and an Inspector-General.

The political divisions of the country form areas for the administration of primary instruction. The provinces are divided into circuits, and the latter into districts. Each district has its school board, which looks after the financial interests of the schools; the governors of the several provinces are responsible for the execution of the school law in their jurisdiction. The technical direction of public primary schools, however, is entirely under the government inspectors, assigned to the several divisions, who are directly responsible to the central authority. At the head of each circuit of a division there is an assistant inspector who comes into immediate relation with the primary schools. Elementary education is by law compulsory for children seven to fourteen years of age, and is gratuitous in public primary schools. The schools are established and partly maintained by the district school boards, but the government pays the salaries of teachers and also augments the local school funds by grants from the treasury. Official statistics for 1908 give 30,000 pupils in average attendance at the public primary schools. This implies an enrollment of nearly 40,000, or at least 10 per cent of the population, which is an unusually high rate, considering the general circumstances of the country. The government appropriation for primary schools already amounts to $325,000 annually, and this sum will be increased by the expenditure for the normal school, which has been projected on a large scale, and for the encouragement of industrial education. A decree of July 16, 1908, provided for the payment of a monthly subsidy of $232.50 to the municipality of the central canton of the Province of Alajuela for the founding and support of a school to give instruction in the manufacture of all kinds of woven fabrics. On Sept. 25, 1909, President González Víquez signed decrees for the establishment of preparatory schools of arts and crafts (*Escuelas Preparatorias de Artes y Oficios*) and of schools of domestic instruction for women in the various provincial capitals. In addition to the regular scholastic course, the new regulations prescribe training in various manual branches, including carpentry, cabinet work, horseshoeing, tailoring, shoemaking, painting, and tinning. In the women's department, instruction will be given in cooking, washing and ironing, sewing, etc., and such branches of higher manual training as are applicable to household arts and home sanitation. To meet the increasing expense of maintaining the primary schools a law was passed on Sept. 24, 1908, establishing a tax of 10 cents per liter of alcohol and other liquor sold in the national factory and its branches, the revenue thereby derived to go to a fund known as the "national education fund."

At the second Central American Conference, held at San Salvador in 1910, provision was made for establishing a pedagogic institute for Central America in Costa Rica. A suitable location for the buildings of the institute was selected in the vicinity of Barba and plans for the erection are in progress. This choice marks a fitting recognition of the educational progress of Costa Rica.

Public secondary and higher education are directly under the minister of public instruction. There are at present five public secondary schools, namely the Liceo de Costa Rica; the Colegio Superior de Señoritas; Liceo de Heredia; Instituto de Alajuela; and Colegio de Cartago. The first three are supported entirely by national funds, while the expenses of the last two are met equally by municipal and national funds. The Liceo de Costa Rica, for boys, has a department given over to normal training, as has also the Colegio Superior de Señoritas. The government divides 130 scholarships between the two institutions, and supplies the textbooks for the holders of the same.

The plan of studies adopted for the Liceo de Heredia illustrates the scope and character of secondary education. The entire course is arranged in two cycles; the first cycle, which is preceded by a preparatory year of elementary studies, comprises three years, with program as follows: —

Subjects	Hours a Week in Class			
	First Year	Second Year	Third Year	Total
Moral and intellectual				
Spanish	4	3	3	10
English	4	4	3	11
French		3	3	6
Geography History	3	3	3	9
Mathematics	5	5	4	14
Physics Chemistry	2	2	3	7
Natural sciences	2	1	2	5
Anthropology Hygiene	1	1	2	4
Morals and civics	1	1		2
Logic and ethics		1	1	2
Total	22	24	24	70
Physical and æsthetic				
Drawing	2	2	2	6
Writing	2	1	1	4
Singing	1	1	1	3
Gymnastics	2	2	2	6
Manual training	2	2	2	6
Total	9	8	8	25
Grand total	31	32	32	95

The second cycle of the secondary course, which comprises two years, is divided into four parallel sections, namely, section of humanities, and normal, commercial, and technical sections.

The program of the section of humanities is as follows: —

the number if the multiplication table of twelves is to be learned. It is a fact that adults do not visualize numbers of any size, a name like " forty-seven " being merely a word in a series, representing four in a series of tens, plus seven in a series of units. In other words, we all use the series idea in dealing with numbers, and it is proper that the child, after he has learned to appreciate the meaning of the lower numbers, should do the same. Counting has the advantage of rhythm and of easily imparting the facts of the necessary number tables. If confined within reasonable limits, it is a valuable aid in the teaching of the elementary facts of number. D. E. S.

COUNTY BOARDS OF EDUCATION. — The County Board of Education, or its equivalent, is found chiefly in the South and along the Pacific Coast. West Virginia, Arkansas, Oklahoma, and Texas, alone of the states of the South Atlantic and South Central divisions, do not have a County Board of Education, though Arkansas and Texas have County Boards of Examiners, which perform some of the functions of County Boards of Education. Indiana, Iowa, and Missouri, alone of the Northern states; and California and Washington, alone of the Western states, have such a body. Minnesota has an *ex officio* board composed of county officers for unorganized territory only; Michigan and Oregon have a County Board of Examiners; and South Dakota has a County Textbook Commission. The terms County Board of Public Instruction, County School Commissioners, and County Board of School Directors, are sometimes used instead of County Board of Education.

The composition and method of appointment or election of the different County Boards vary greatly in the different states. In Iowa, Indiana, Virginia, and Kentucky, the County Boards are composed of *ex officio* county or school officers. The County Textbook Commission of South Dakota is a large and also an *ex officio* body. As with *ex officio* State Boards of Education, the powers .and duties of these *ex officio* County Boards of Education are not very large. In Delaware and Maryland the County Boards are appointed by the Governor; in North Carolina they are elected by the legislature; in South Carolina they are appointed by the State Board of Education; in Georgia, they are elected by the Grand Juries; in Tennessee they are appointed by the County Courts; in Mississippi they are appointed by the County Superintendent; in Alabama, Florida, and Louisiana they are elected by the people; in Missouri one member is appointed by the County Court, and one by the State Board of Education; and in California and Washington, the members are appointed by the County Supervisors, or Commissioners. The Board of Examiners in Michigan, Oregon, and Texas are appointed by the County Superintendent.

No uniform practice prevails either with reference to the character or the qualifications of the persons elected or appointed. In California the law requires that a majority of the board members shall hold valid teachers' certificates; while in Louisiana the law provides that no teacher shall ever be eligible for election. In Washington the appointed members must all be experienced educators; while in the Southern states having elective boards, the members are usually lay members. In the Southern states, where the County Boards are elected or appointed, or are composed, *ex officio* of the head school officials of the county, they have been intrusted with much more important functions than is the case with the few County Boards of the North and West.

In the Southern states, the county system of school administration (*q.v.*) has in large part supplanted the district system, with the result that a strong centralized system of administration has supplanted the decentralized, and, in the South, extremely inefficient, district system of administration. It would not be possible to make any very substantial progress in the Southern states under the district system as found in many of the Northern and Western states. The common functions of the County Boards of Education in the Southern states are to divide the county into school districts, and to establish schools for the two races, as needed; to consolidate schools, and to transport pupils when deemed desirable; to employ all teachers, to fix their compensation, and to pay them their salaries; to acquire and hold the title of all school property, to keep the same in proper repair, and to purchase all school apparatus; to prescribe the branches of study, and to provide such graded and high schools as they deem necessary; to appoint a local representative, or trustee, for each school, to act as the representative of the board in each district; to determine the rate of county tax for schools; and, frequently, to elect the County Superintendent of Schools. The County Superintendent frequently acts as a member of, and more usually as the Secretary of the Board, and always as its executive officer. The future of the County Board of Education is not as yet definitely settled. With the centralization of power in the state these boards have recently lost some of their functions, such as the examination of teachers, the control of institutes, the adoption of textbooks, and the formulation of courses of study. On the other hand, the same tendency toward centralization has given the County Boards many functions formerly possessed by the school district authorities. With the tendency manifest on all sides toward the centralization of authority to secure efficiency, there is every prospect that more states will adopt the plan, and that the County Board of Education will in time become a strong and a useful body.

The success of such boards depends in large burg, and Paris, he insisted on the importance of original sources and material for a study of the subject. His lectures at the Sorbonne, where he was first professor of ancient and then of medieval history, attracted large audiences. The latter chair was established in his honor. For a short time he was also director of the École Normale. Coulanges won a great reputation through his excellent writings in history and sociology. The most important of these are *La Cité Antique* (1864), a book dealing with the religion, laws, and institutions of Greece and Rome, and *Histoire des Institutions politiques de l'ancienne France* (1875–1890). The latter work is not complete. Coulanges was a painstaking student who in his works combined ability in research with clearness and polish in style.

COUNCIL OF EDUCATION. — One of the departments of the National Educational Association, organized about 1884. It has a limited membership (sixty in 1906) elected out of the active members of the Association. The special purpose of the Council is to afford opportunity of closer study of problems which demand research and special investigation. When it is found that a special report is desirable, the Council makes recommendations to the Board of Directors to this end. A variety of reports like those of the Committee of Ten, (*q.v.*), the Committee of Twelve, the Committee of Fifteen (*q.v.*), and the Committee on teachers' salaries have been projected by the Council. In recent years a special feature of its meetings, which take place at the same time as those of the National Educational Association, has been a report on educational progress for the year.

See also National Education Association.

COUNTERPOINT. — See Musical Terms.

COUNTING. — The first step in the historical development of arithmetic was to count things. The world seems to have taken this natural prerequisite step long before it had any idea of the operations on numbers. Indeed, certain lower forms of animals have a kind of pseudo-counting that enables them to distinguish between numbers of like objects up to five or six. The primitive savage seems to have been content to count only to two or three. These, therefore, were primitive limits that in time developed into primitive scales, so that hunters counted by braces as we count by tens, a custom that was found by the early explorers of Queensland and New Holland. Three seems to have been quite a general scale, and still has the primitive meaning of much or many, as in the Latin *ter felix*, and the English "thrice blessed." Four seems also to have been a radix for counting, as when fishermen count by throws or casts, and as in the Latin *ter quaterque beati*. The first generally received radix was five, because of the five fingers on the hand, and there are many traces in language of the use of the word for hand to signify the number five. There are few traces of scales between five and ten, because a people that used the fingers of one hand for their radix would naturally use the fingers of two hands if they needed a larger radix. There seems at an early stage, however, to have been a rather extended use of the radix twelve, perhaps derived from the lunations, but probably because it is a more convenient radix than ten. The convenience of a radix depends upon two things: (1) its divisibility, allowing for numerous factors, and (2) its size. If a radix is too small, a written number becomes too long for convenience, thirty-two on a scale of two being written thus: 100,000, which is 10,^{6} 10 meaning one two and no units. If a radix is too large, then too many different characters must be learned, the number of characters being the same as the radix. On account of its medium size and of its divisibility, twelve is a particularly desirable radix for a system of counting, and it is unfortunate, from the mathematical point of view, that mankind did not have twelve fingers so as to lead to counting on a duodecimal scale.

About the year 1880 considerable interest was manifested in educational circles in the counting method of teaching the number tables. This interest was due largely to the works of two German teachers, Tanck and Knilling. They asserted that number is not properly the subject of sense perception, as the followers of Pestalozzi had assumed, but that it was put into things by the mind. They, therefore, proposed to make much of the mere sequence of number names, and to utilize the child's love for the rhythm of counting. Hence they brought children as soon as possible to count rapidly, far beyond the numbers that they could visualize, allowing the association with large groups of objects merely to be suggested by the association with small groups. By this plan children count rapidly by twos, from one to nine and from two to ten, thus learning both the addition and the multiplication table of twos. They then count by three from one to thirty-one, from two to thirty-two, and from three to thirty, thus learning the addition and multiplication tables of threes. In like manner they continue until they count by tens. If subtraction is taught by the addition method, no subtraction tables need be learned, although both Tanck and Knilling had the children count backwards so as to learn the subtraction tables as well. There have been recent improvements upon this method, children counting first by tens and by fives, and then by the other numbers to ten. The counting method has much to commend it if not carried beyond the proper limits. There is no reason, however, for counting by any number beyond ten times that number, or twelve times the number if the multiplication table of twelves is to be learned. It is a fact that adults do not visualize numbers of any size, a name like " forty-seven " being merely a word in a series, representing four in a series of tens, plus seven in a series of units. In other words, we all use the series idea in dealing with numbers, and it is proper that the child, after he has learned to appreciate the meaning of the lower numbers, should do the same. Counting has the advantage of rhythm and of easily imparting the facts of the necessary number tables. If confined within reasonable limits, it is a valuable aid in the teaching of the elementary facts of number. D. E. S.

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The composition and method of appointment or election of the different County Boards vary greatly in the different states. In Iowa, Indiana, Virginia, and Kentucky, the County Boards are composed of *ex officio* county or school officers. The County Textbook Commission of South Dakota is a large and also an *ex officio* body. As with *ex officio* State Boards of Education, the powers and duties of these *ex officio* County Boards of Education are not very large. In Delaware and Maryland the County Boards are appointed by the Governor; in North Carolina they are elected by the legislature; in South Carolina they are appointed by the State Board of Education; in Georgia, they are elected by the Grand Juries; in Tennessee they are appointed by the County Courts; in Mississippi they are appointed by the County Superintendent; in Alabama, Florida, and Louisiana they are elected by the people; in Missouri one member is appointed by the County Court, and one by the State Board of Education; and in California and Washington, the members are appointed by the County Supervisors, or Commissioners. The Board of Examiners in Michigan, Oregon, and Texas are appointed by the County Superintendent.

No uniform practice prevails either with reference to the character or the qualifications of the persons elected or appointed. In California the law requires that a majority of the board members shall hold valid teachers' certificates; while in Louisiana the law provides that no teacher shall ever be eligible for election. In Washington the appointed members must all be experienced educators; while in the Southern states having elective boards, the members are usually lay members. In the Southern states, where the County Boards are elected or appointed, or are composed, *ex officio* of the head school officials of the county, they have been intrusted with much more important functions than is the case with the few County Boards of the North and West.

In the Southern states, the county system of school administration (*q.v.*) has in large part supplanted the district system, with the result that a strong centralized system of administration has supplanted the decentralized, and, in the South, extremely inefficient, district system of administration. It would not be possible to make any very substantial progress in the Southern states under the district system as found in many of the Northern and Western states. The common functions of the County Boards of Education in the Southern states are to divide the county into school districts, and to establish schools for the two races, as needed; to consolidate schools, and to transport pupils when deemed desirable; to employ all teachers, to fix their compensation, and to pay them their salaries; to acquire and hold the title of all school property, to keep the same in proper repair, and to purchase all school apparatus; to prescribe the branches of study, and to provide such graded and high schools as they deem necessary; to appoint a local representative, or trustee, for each school, to act as the representative of the board in each district; to determine the rate of county tax for schools; and, frequently, to elect the County Superintendent of Schools. The County Superintendent frequently acts as a member of, and more usually as the Secretary of the Board, and always as its executive officer. The future of the County Board of Education is not as yet definitely settled. With the centralization of power in the state these boards have recently lost some of their functions, such as the examination of teachers, the control of institutes, the adoption of textbooks, and the formulation of courses of study. On the other hand, the same tendency toward centralization has given the County Boards many functions formerly possessed by the school district authorities. With the tendency manifest on all sides toward the centralization of authority to secure efficiency, there is every prospect that more states will adopt the plan, and that the County Board of Education will in time become a strong and a useful body.

The success of such boards depends in large measure upon a clear differentiation of legislative and executive functions, and on the personnel of the board and the executive officer it selects. In a supervisory capacity, County Boards have seldom proved themselves to be of much service. If composed of teachers who are engaged in teaching themselves, they are too busy; if composed of laymen, they do not know enough about school work to keep from constant blundering. The best service will always be obtained from such bodies by giving them large legislative functions only, and the choice of properly qualified administrative officers to carry out what they decide. The principles underlying good city school administration apply equally well to county administration. Where it is composed of teachers, the board is useful chiefly in assisting the County Superintendent in conducting the examinations of pupils and teacher, in formulating a course of study for the schools, and in making rules and regulations for the government of pupils and teachers. A board made up of teachers alone is very likely to be so conservative, and to act so continually along traditional lines, that no progress of the kind needed will be possible.

For a more detailed statement of the method of appointment, powers, and duties of the County Boards of Education in the different states, see the articles on the different state school systems, — as ALABAMA, ARKANSAS, CALIFORNIA, etc. E. P. C.

Reference: —

A Tentative Plan for a County Board of Education. *Bull.* No. 2, of the Illinois Educational Commission. (Springfield, 1908.) 53 pp. Tabulates conditions in the different states. Contains a good bibliography of thirty-five titles.

COUNTY BOARDS OF EXAMINATION.— See EXAMINATION BOARDS.

COUNTY SUPERINTENDENT OF SCHOOLS. — See COUNTY SYSTEM OF ADMINISTRATION; SUPERINTENDENT OF SCHOOLS.

COUNTY SYSTEM OF ADMINISTRATION. — A form of school administration in which the county is the administrative unit, all school business, outside of the cities, being handled by a County Board of Education instead of district boards of trustees. (See article on COUNTY BOARDS OF EDUCATION for an outline of the functions and duties of such boards under the county system of school administration.)

Advancing from the district system of school administration (see articles on DISTRICT SYSTEM, DISTRICT MEETING, and DISTRICT BOARDS OF TRUSTEES), with all of its evils and defects, we have first the town system (*q.v.*) of Massachusetts or the township system (*q.v.*) of Indiana; then as a further advance the division system (*q.v.*) of Kentucky; and then the county system, as exemplified in the school systems of Florida, Georgia, Alabama, and Louisiana. (See articles on the state systems in these states for detailed accounts.)

Under the county system all of the schools of the county, — not organized under a separate city or independent district system, under a board of education of its own, and having a special supervisory officer appointed by its special board, — are placed under the control of a County Board of Education, of from three to five members, elected or appointed, varying in this in the different states. A desirable plan is a County Board of Education of five members, elected by the people of a county, either at large or from County Commissioner or County Supervisor election districts, and only a part going out of office at any one time. This board represents the people, and is responsible to them, but the board, and not the people, selects the County Superintendent of Schools and the teachers, and performs the executive functions which the people at present attempt to perform in so many states.

The county system of administration centralizes and standardizes the schools of a county, largely eliminates the local quarrels and friction which so often play havoc with the working of the schools, does away with the incompetent management on the part of elected trustees, makes it possible to secure adequate and professional supervision, and insures better educational returns for the money expended. In effect, the county system merely applies the well-established principles of good city school administration to the conduct of country schools. It raises the work of the County Superintendent of Schools from a political and a clerical status to that of an educational expert, selected and retained because of personal efficiency, and it applies the business methods of large business concerns to the conduct of the educational business of the county. If five men are able to handle successfully and efficiently the educational affairs of such a city as Boston, with nearly three thousand teachers employed, and an annual expenditure of nearly four millions of dollars, it does not require three trustees for every little rural school to maintain a county educational system. The schools of the county would be much better managed, both from a financial and an educational point of view, if they were controlled and managed by a central board with a sufficient force of executive and clerical assistants. E. P. C.

COURSE OF STUDY, THEORY OF. — The course of study may be considered from two quite distinct points of view. On the one hand, we may accept the curriculum as it obtains at a given time, and consider how each constituent study may be treated so as to make it most effective; what materials are available and what methods of presentation and enforcement are most successful. Arithmetic, geography, history, reading, spelling, and all the studies may be thus treated. The results constitute a very important part of pedagogy or educational doctrine. Treatment from this practical point of view may also be extended to take into account the arrangement of these studies from the standpoint of the working school program, their proper grouping simultaneous and successive, the allotment of time to each study, the alternation of study and recitation periods appropriate to each subject, etc.

On the other hand, there is the philosophical theory of the Course of Study. From this standpoint, the problem does not grow out of accepting the currently established curriculum and asking how it may be perfected in efficiency, but centers about the ground and justification of any body of subject matter, and the reason for being of each constituent ingredient as a special means, or division of labor, for fulfilling the function of subject matter as a whole. (See PHILOSOPHY OF EDUCATION.) However, it is neither necessary nor advisable to draw a sharp line between the more concrete or practical point of view and the more theoretical problem. In a transitional time like the present there is no absolutely fixed and established body of subject matter. From the practical standpoint certain subjects are relatively retiring from the field; new subjects are being introduced or are clamoring for recognition. A generalized conception of the function to be served by the subject matter of education, of the various phases and factors of this function, and of the relation of various types of study to these different factors, can hardly fail to throw some light on the problems of the conflict and respective claims of various studies. Questions of the practical adjustment and sequence of studies and topics also run into problems of correlation (*q.v.*), concentration (*q.v.*), and isolation, which have some philosophic basis and bearing. In this article, the philosophic aspect of the course of study is considered, and with reference to the following problems: (1) the significance of subject matter in general; (2) its relation to experience; (3) its classification.

1. Viewed externally, the various studies present many independent collections of facts and general principles, each of these collections having its own distinctive logical basis and organization. Some of the studies represent forms of skill or of special ability to be acquired, — reading, writing, drawing, etc. Regarded in this external way, there is a great gap between the experience of the pupil and the subject matter which he studies. Three points of contrast may be noted. ① The child's experience is intensely social and personal. Every parent and every teacher knows that children naturally respond with a personal association to any incident or fact; what cannot be translated into terms of something which they themselves have done, or something that is connected with the activities of their friends, is not comprehended, or leaves them cold and indifferent. Experience centers about persons; things that are noted and recalled are things that play some part in the lives of persons. The material of studies, on the other hand, is impersonal and objective. It extends beyond the little world of persons with which the child is acquainted; it ignores all that is peculiar and precious to each individual. Over against the limited but social field of familiar friends, studies introduce the external world, infinite in space and time. ② In the second place, there is a striking contrast between the fluid continuity of children's experience and the hard-and-fast subjects of the curriculum. The child passes quickly and readily from one incident, one place, one idea, to another, and each blends insensibly into the other. He is absorbed in the present, and the present melts vaguely in indefinite vistas. His world is too fluid to permit of sharp separations or isolations. There is not even a dividing line between man and nature, to say nothing of between various phases of man's activities and various aspects of nature. The specific studies that form the curriculum represent this dissolving unity precipitated into detached and rigid subjects. Its world of experience is partitioned off into independent compartments. The unity of life appears simply as an aggregate of separate parts, such as arithmetic, geography, astronomy, physics, etc. ③ Finally, the connecting links of direct experience and of a study are of radically different sorts. Affections, sympathies, inclinations, interests are the axes which hold together the diversity of fact and episode of ordinary experience. In a subject of study, facts are torn away from this primitive matrix, and are classed in a new way on the basis of a principle which is abstract and intellectual. The meaning of facts consists no longer in what they are worth to a person, but in the capacity of one fact to stand, impartially and objectively, for another. The classes, the genera, of natural experience are things that *feel* alike or that have the same value; studies present groups of facts that may be logically derived from a common principle.

These three contrasts ① the personal and narrow world of the child and the impersonal and indefinitely extended world of the studies; ② the fluid continuity of experience and the specialized divisions of the curriculum; ③ the practical and emotional ties of life and the logical basis and system of subject matter, define the problem of the significance of subject matter. *The studies represent selections* and formulations of what is regarded as most important in the experience of the race, and hence most necessary to transmit for the sake of the future of society. Subject matter is to be regarded from a social point of view. Every human group, at every stage of development, from the tribes of savages, to the national states of the present day, has certain customs and manners of living, with which are associated certain forms of skill, trained ability, accumulated knowledge, and practical and moral aims. To habituate the young to these customs, to discipline them in the acquired modes of skill, to inform with the knowledge possessed, and, above all, to permeate them with the current ideals, is necessary to the conservation of the type of social life in question. When community life is simple, the function of transmission is performed by personal contact and intercourse and by the sharing of the young and old in common activities. But as associated life becomes more complex, it becomes more and more impossible to secure the requisite continuity of institutions by such informal means. As the tribal traditions become richer and fuller, and the technique of the arts, industrial, military and magical, more elaborated, division of labor occurs, and certain persons are set aside, as it were, to attend particularly to these things and to their perpetuation. These persons become the instructors of the community, and through them certain bodies of knowledge and belief and certain modes of skill are more or less differentiated and isolated. Instead of existing in solution, as it were, in the ordinary experience of the members of the community, they are precipitated. The need of special instruction going along with specialized legends and activities is probably the chief motive force in compelling self-conscious, reflection upon naïve and customary experience. Instead of the development of sciences leading to instruction, the demand for instruction led to the selection and formulation into definite bodies of subject matter of achievements and traditions that had previously been carried by the main stream of direct social intercourse.

It is not intended to trace the historic process by which out of these early crude condensations of various forms of tribal custom, belief, and skill, our present curriculum has been built up. Reference to the simple and more primitive types of education is here made because of the light thrown upon our problem of the significance of subject matter in general. This reference enables us to see that, fundamentally, geography, history, arithmetic, grammar, physics, etc., do not exist as studies simply for the sake of affording material of discipline or of intellectual improvement or general culture to pupils, nor because knowledge is inherently desirable in the abstract, but because there are certain values, activities, purposes, and beliefs currently existing in social life which absolutely must be transmitted to the succeeding and immature generation if social life itself is not to relapse into barbarism and then into savagery. On its face, geography is so much systematized knowledge about the earth. Fundamentally, however, it does not enter into the course of study just because of the objective facts themselves, but because of the rôle these facts play in the social organization and intercourse of a people. The same holds true, in its own way, of each factor of the course of study. Summing up, we may say that the significance of the subject matter that forms the material of the course of study is to present phases and results of community life having such typical value that it is necessary to insure their continuous transmission.

2. What is the relation of this subject matter to the ordinary, immediate experience of pupils? It is to be noted that when we consider the course of study from the social point of view, we gain a notion of this relationship, which is very different from that entertained when, as is too common, we regard it from a purely intellectual, or logical, point of view. If the course of study is regarded simply as a body of material which has its significance in itself (whether as pure objective information or as a collection of modes of technical skill), the three antitheses already mentioned are much accentuated. It is difficult to discover points of natural community and transition between the everyday experience of children, their activities, purposes, and methods of cognition out of school, and the elaborate intellectual subdivisions and systems of abstract bodies of knowledge regarded as ends in themselves. But if we treat the organized subject matter of textbooks and formulated curricula as indications of socially important results to be employed not as self-sufficient ends of learning, but as stimuli to the progressive induction of pupils into a richer and fuller life, the situation is quite different.

The experience of pupils is already more or less socialized. It has been built up through suggestions and interpretations derived from the social groups of which the child is already a member. It is already saturated with social values that are akin to those presented in the studies of the curriculum. When taken statically and in cross section, these studies are ready-made; they are hard-and-fast classifications. But if we take them historically, we find that they are gradual growths and precipitates of the experience of the race. The race also began with a crude immature experience, and out of this condition has gradually evolved the richer and more exact experience represented in the course of study.

Since, therefore, these studies are social products of the same sort of powers and conditions that are now found in child experience, there must be many points of kinship and contact between them and the present embryonic experience of the child. The primary business of education is to discover these points of likeness, and to make them the starting points of a guided development. The child's present experience and the subject matter of instruction, instead of existing in two separate worlds, one wholly psychological, the other wholly logical, *represent two changing or dynamic limits of one continuous social process.*

Looking at the problem from the side of the child, we find that his experience is not a static or finished thing needing to be stimulated to grow from without. It is transitive, full of motives and outreaching forces that compel its own modification and reconstruction. It is self-transforming, so that the problem of education is not to engraft foreign and remote material upon an indifferent, passive person, but to supply an environment which will direct the changes that are bound to occur anyway toward the desired social result. (See EXPERIENCE for the further development of this topic.)

3. Classification of Studies. — What has been said indicates a convenient and fruitful principle for classifying the subject matter of instruction. First come those studies which, looked at from the standpoint of the child, are not studies but modes of social activity and experience, and which, looked at from the standpoint of the educator, are typical embodiments of social values that represent important ends to be attained in instruction. Elementary education has already included within itself (for a variety of reasons) such activities as gardening, cooking, sewing and weaving, constructive work in paper, leather, wood, metal, care of animals, excursions, singing, story telling, dramatizations, drawing, painting, designing, sand molding, clay modeling, plays and games, etc. These modes of activity are not psychological merely; they do not simply appeal to and express the more native and spontaneous impulses of children; they also present important social processes; they typify occupations that are indispensable to the continued existence of community life. Moreover, as processes they condition intelligent study of social products. (See CULTURE EPOCH THEORY.)

Probably the main motives for introducing these activities into the primary curriculum have been psychological and utilitarian, rather than any conscious perception of their value as social types. That is to say, they have made their way because children were found to be interested in them, because they furnished devices for teaching the three R's more easily, because they afforded relief and recreation from more severe intellectual studies, and because they seemed to prepare children for the later business of making a living. For this reason, they have been inserted into the curriculum, or superimposed upon other studies, without any particular transformation of other studies, or any organic connection with them. They have been for the most part simply additional school studies. It remains to utilize them systematically as foundation stones for the other studies by teaching them as representatives of these social activities which are fundamental to the knowledge and modes of skill embodied in these other studies.

History and geography (including, for convenience, nature study under the latter term) are the members of our second group. They are to be considered as the *background* of the direct social processes exhibited in the group just considered. History sets forth the temporal background; the evolution of the gradual control of the activities by which mankind has enriched and perfected its experience. From the pupil's standpoint, the direct activities in which he engages lead constantly out into this historic field. Children must begin naturally with simple operations, whether in cooking, weaving, woodwork, or whatever. These simple operations agree of necessity in their main features of crude material and simple tools and technique with the operations of men in the less developed, the earlier, periods of social life. In their contrast with the elaborate complicated products and machinery of contemporary occupations, they present the problem of the historic step by which the gap has been bridged. They introduce questions regarding the social effects of the industrial activities they typify, and the nature of the inventions by which the progress of society has been effectively secured. They lead, in other words, not only to the economic history of mankind, but to the political and scientific history associated with man's economic development.

On another side, these activities necessitate consideration of the natural background, a study of the globe from which materials are drawn, of the various plants, animals, minerals, etc., that supply the raw material, and the various conditions, climatic, physiographic, etc., under which these materials originate; they also require study of those physical and chemical energies that are involved in the tools and operations employed. In the history of the race, the sciences have been slowly developed out of practical necessities — anatomy and physiology out of sickness, accidents, and the need for keeping well; botany out of agriculture and the search for medicinal remedies; physics out of mechanical devices for getting results more economically and on a large scale; chemistry out of dyeing, metal working, the refining of crude natural products; geometry out of measuring land, erecting buildings, etc. The natural differentiation of studies with pupils follows the same general sequence of evolution.

There are also found in the curriculum various studies and aspects of studies that represent technical skill and intellectual or logical methods in the abstract, *i.e.* on purely intellectual grounds. From the standpoint of our fundamental criterion, the social, these abstract and technical methods signify the instrumentalities by which complex and progressive communities are maintained in being. From one standpoint, mathematics is a pure science, organized on logical grounds for the sole sake of the perfecting of knowledge. From another point of view, mathematics represents an absolutely indispensable organ, or method, of any social life that rises above barbarism. In like fashion, written and printed language, while, on its face, a purely symbolic device for the recording and communicating of thought and objective information, is, in its concrete setting and function, a device of social life. Oral language is transitory; it leaves behind itself no permanent deposit. Where it alone has been achieved, social development is restricted to what can be carried by personal memory and communication. When written and printed symbols came into use, the net results of the past could be economically conserved, their transmission was facilitated, and they themselves were emancipated, by their symbolic or abstract representations, from all sorts of local and irrelevant associations. Generalization and organization of future activities were rendered possible. Now it follows, it goes without saying, that the educational significance and motivation of the studies that have to do with the mastery and use of symbols should be based, not upon their purely theoretical values, but upon their value as social methods and instrumentalities. This mode of approach is secured in the degree in which this class of studies is organically connected with the two classes previously described. While the reaction in the elementary curriculum against the domination of the " three R's " has proceeded practically and unconsciously in response to specific exigencies, its philosophical justification lies in the fact that it recognizes that studies dealing with formal or symbolic materials have to be motivated and led up to through educational content of a more direct and social character.

The scheme of classification indicated makes no provision for literature and the fine arts. Art — in the æsthetic as distinct from the technical and industrial sense — is to be regarded as a perfected expression of any crude or primitive mode of activity which has gained a recognized social value. It is essentially a *consummation*, a refinement and idealization of what is originally done and acquired from more direct and practical motives. It represents the end to which all other educational achievement should tend — its perfected goal. J. D.

See Arts in Education; Correlative; Concentration; Culture Epoch; Education; Philosophy of Education.

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COURSES OF STUDY, or COURSES OF INSTRUCTION. — A graded outline of the subjects of instruction, the order to be followed in pursuing them, and the amount of each to be completed in definite portions of time. Such an arrangement of studies is usually called a graded course. A daily arrangement of work in the different studies is called a *program.*

The Prescription of Courses of Study. — There is great divergence in the different states, counties, cities, and towns in the means by which courses of study are determined and in the amount that is prescribed by authority from above. Rhode Island, with nothing required but temperance physiology, and the maintenance of a high school or the provision of high school tuition, stands almost alone among the states in the absence of requirements. Almost everywhere certain statutory studies are enumerated in the school law, and districts are permitted to add other studies to those required to be taught, if they have the money to provide the extra instruction and the time in which to impart it. Almost everywhere the school law of the state requires that instruction shall be given in reading, writing, spelling, arithmetic, geography, and history of the United States. These studies are prescribed for all schools alike, and have been common requirements for years. Most states require also that all schools shall be taught in the English language, though in states where large numbers of Germans are found instruction in the German language for a part of each day has been authorized as a necessary concession to the German people. Similarly instruction in the French language has been authorized in Louisiana. Some of the Southern states require instruction in the history of their state, and a number of the Western states have recently added instruction in the elements of agriculture. Morals and manners, physiology and hygiene, and civics are required by a number of states, and music, drawing, elementary bookkeeping, humane education, domestic science, and manual training are also named as either optional or required studies by a few others. Even when named as required subjects in the law, such requirements are seldom stated otherwise than in the most general terms, and the different school administrative units are left free to work out the details of such instruction in such form, and to provide the instruction only in such grades, as they see fit.

An exception to this rule is found everywhere in the case of temperance physiology. This most definite and compulsory requirement has been added to the list of required studies in every state and territory since 1880, as the result of the efforts made for it by the Woman's Christian Temperance Union. As generally stated, the statutes require that "the elements of physiology and hygiene, with special reference to the effect of alcohol and narcotics on the human system, shall be taught to the pupils of each grade of the public schools." In many states the teachers are required to state on oath that they have given the instruction as required by the law. (See article on TEMPERANCE, INSTRUCTION IN.) So long as the state merely enumerates the subjects of study, and leaves to the school units the working out of the outlines of instruction, such enumeration of statutory studies does not mean much. The old fundamental school studies would be taught in the schools if no statute requiring it existed. For such studies as music, drawing, manual training, and domestic science their enumeration in the statute does exert a certain amount of pressure, but the nature and the extent of the instruction is still left to the school units to determine. When the state, or the county, adopts a series of uniform textbooks for use in the schools, a new force tending toward more uniform and obligatory instruction is put into operation; and when the state, or the county, goes still further and issues an outline of work to be followed by the teachers in the schools, the force operating toward uniform instruction is greatly increased. A few states have outlined state courses of study, but county courses, with freedom to the cities, are much more common.

State Courses of Study. — Such courses are generally outlined by the State Board of Education or the State Superintendent of Public Instruction, though in a few cases a State Commission has been created, and in one state the State Teachers' Association has been the active body in working out the course. Such courses are based on the statutory school studies and the state series of textbooks, if such exist, and try to outline the minimum quantity of work for each school year. Outlines of courses of study for high schools are frequently included, and sometimes the accrediting of high schools is made dependent on the use of one or more of such high school courses. The outline usually is not in great detail, and leaves room for local options and initiative in carrying out the course. Not infrequently the state course of study issued is advisory rather than compulsory; the state courses of study issued by the State Boards of Education in Indiana and Massachusetts are examples of such. In New York State the uniform effect of a rigid state course of study is produced by the system of state examinations, conducted by the State Department of Education at Albany, and by the issuance of syllabi of instruction upon which the examinations will be based.

Some examples of compulsory state courses may be mentioned. In Arkansas the State Superintendent of Public Instruction is directed by law to prepare an outline course of study for the schools; but as he is prohibited from referring to any textbooks, the course of study issued must be general and flexible. Oregon and Washington have state courses of study, the use of which is compulsory, except in the larger cities. North Carolina, Tennessee, and Maryland have state courses of study, the use of which is compulsory throughout the state, except in the largest cities. In Utah a law enacted in 1907 created a state commission, consisting of the Superintendent of Public Instruction, the Principal of the State Normal School, the Principal of the State Training School, and two county superintendents to be appointed by the State Board of Education, to meet, formulate, and prescribe a state course of study, which must then be used by all schools except county school districts of the first class, and cities of the first and second class.

(See special articles on the different state school systems.)

There is a tendency, though not marked as yet, for the states to take the matter of outlining courses of study upon themselves and away from the counties. So long as the course outlined represents minimum requirements and is flexible, the good that comes from such uniformity more than counterbalances any tendency toward dead uniformity. Detailed and specific requirements would prove more harmful than beneficial. The best progress has been made by leaving communities free to go beyond the average of work about them, and this right should always be maintained.

County Courses of Study. — County uniformity in courses of study is much more common than state uniformity. Outside of New England, where the county is not used as a unit of school administration, county uniformity, in some form or other, is found in practically every state not following a state course of study. In the Northern and Western states, cities of any size are exempted from following the county course of study, and in the Southern states the larger cities and the locally independent systems are likewise exempt. The cities in such cases are free to form their own courses of study, though cities and counties alike are required to include the statutory studies. Where the County System of School Administration (*q.v.*) prevails, as in certain Southern states, the county course of study naturally follows and is binding on all schools except those organized under special laws. Where a partial county system prevails, as in the Western states, the county course of study is likewise found, and usually applies to all schools of the county except cities organized under boards of education and employing a superintendent of schools.

County courses of study are usually prepared by the County Board of Education, if such a body exists in the county, or by the County Superintendent, if there is no County Board. Often committees of teachers act unofficially in an advisory capacity. County courses of study, intended as they are for the use of rural and village teachers, are usually made out and printed in some detail, and the annual county examinations for promotion and graduation are based on the proper completion of certain portions of these outlined courses. In New England the town, or group of towns, where supervisory unions exist, is the administrative unit which outlines the course of study.

City Courses of Study. — Large cities practically everywhere have freedom to arrange their own courses of instruction and in their own way. While including all of the statutory school studies, and in about the same order as the rural and village schools, the work is done much more extensively and intensively, and calls for a different form of outline for the guidance of teachers. City courses of study are usually printed in much more detail, and many of the courses of study issued by the larger cities are elaborate and carefully worked out documents, the result of much careful work and much accumulated experience.

In the smaller cities the Superintendent of Schools usually prepares the course of study, and the Board of Education formally adopts it for use in the schools, though in many cities a committee of the Board of Education on course of study attempts to do what the laws generally give it the legal right to do, but which it is no longer competent to handle. In the larger cities the Superintendent and his assistants prepare the course of study, usually after conferences with committees selected from the teaching force, and the course is promulgated by the Superintendent and altered as necessity arises. In cities having a modern organization the right to formulate the course of study is guaranteed to the Superintendent and his assistants by the organic law for the city. E. P. C.

England. — There is no prescribed course of study for elementary schools in England. Each principal may draw up his own syllabus and time-table within the limits of subjects suggested by the Board of Education in the Elementary School Code. These are subject to the approval of His Majesty's Inspectors, who may, where they see fit, also approve of the inclusion of any subject not suggested by the board. The board does, however, issue *Suggestions for the Consideration of Teachers and Others*, which include specimen schemes or courses of study and discussions of methods. But these are merely by way of suggestion and not prescription. The same practice of approving the curriculum and time-table as drawn up by the school principal is observed in secondary education.

Germany. — The practice in Germany is much the same as that in England, with the difference that the nature and extent of the subjects which are to be taught are definitely prescribed even so far as the time allotment. From this scheme only the larger towns vary. The course of study, as well as a diary of work done, are subject to inspection and approval.

France. — The course of study in France is rigorously prescribed by the central bureaucratic authority, and no subject may be added without its consent. The control is exercised through the Academy Inspectors. The tendency, at present, is to allow more local freedom and initiative, and the period, when the Minister of Education could look at his watch and say exactly what subject was being taught then throughout the country, is passing away.

See the separate articles on the various national systems.

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COURTIER, EDUCATION OF. — See GENTRY AND NOBLES, EDUCATION OF; PRINCES, EDUCATION OF.

COUSIN, VICTOR. — The son of a watchmaker of Paris; was born in 1792 and died at Cannes in 1867. After a brilliant academic career, in which his love for music was shown and came near determining his future course of study, he finally decided to take up philosophy, largely as the result of the influence of Royer-Collard and Maine de Biran, his teachers. In 1815 he succeeded the former as professor at the Sorbonne, where he did much to promote the reaction against the sensualism of Condillac (*q.v.*). His system he himself calls eclecticism; but the influence of German idealism and Scottish realism are specially noticeable. He was a prolific and fruitful writer, and his career at the Sorbonne revived the halcyon days of Abélard (*q.v.*) and William de Champeaux (*q.v.*). So far as education is concerned, he, like many other teachers of the period of the Revolution, was chiefly interested in getting his fellow countrymen to reform the French system of public instruction. He was for eight months (1840) Minister of Public Instruction under Thiers. Five years before (1835) he published his famous *Report on the State of Public Instruction*, a work which exercised considerable influence both in France and America at the time, and in which he shows, from the example of other countries, like Holland and Germany, that public utility necessitates the compulsory education of all children. His career was identified with the great struggle of France for civil and intellectual liberty, and the main purpose of his activity was to show that enlightenment and social progress are inseparable. He also aided in the work of reorganizing university instruction by his careful studies of educational systems abroad, especially in his two works, *De L'Instruction Publique dans quelques Pays de l'Allemagne et particulièrement en Prusse* (*Public Instruction in Germany*, 1833), and *De L'Instruction Publique en Hollande* (*Public Instruction in Holland*, 1837).

H. D.

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  Defense de l'Université et de la Philosophie. (1844.)
  Justice et Charité. (1844.)
  Du Vrai, du Beau et du Bien. (1853.)
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COWLEY, ABRAHAM (1618–1667). — Although best known as a poet, Cowley was the author of two interesting educational essays. About 1656 he wrote the *Plan of a Philosophical College or Proposition for the Advancement of Experimental Philosophy*, in which he combines the suggestions in Bacon's *New Atlantis* with those of Milton's *Tractate.* The college was to be founded with an endowment of £4000, but it would soon pay its own way, "for the industry of the College will in a short time so enrich itself as to get a far better stock," and owing "to the public benefit to accrue to mankind and chiefly to our nation," public liberality would continue. There were to be twenty professors, four of whom were to travel for three years into the four parts of the globe and send reports on "all things that belong to the learning and especially the natural experimental philosophy of those parts," and return with "books, simples, animals, stones, minerals, and metals." Emphasis was to be placed on the truth of the accounts. The resident professors were to lecture publicly and to study "all things contained in the catalogue of natural histories annexed to my Lord Bacon's *Organon*," and "every third year the college shall give an account in print in *proper and ancient Latin* of the fruits of their triennial industry." To the college a school was to be attached, free and open to boys of thirteen. "A method was to be established for the infusing of knowledge and language at the same time to them and that this may be their apprenticeship in natural philosophy." Hence such of the classics as dealt with scientific subjects were to be read: in fact, the curriculum hardly differs from that suggested in Milton's *Tractate*, and has most of the features of the *Academies* (*q.v.*) which were then in the air.

In another work, *An Essay on Agriculture*, after dwelling on the advantages of that form of industry he advocates the establishment of one college in each university for this study, where the professors would not "read pompous and superficial lectures out of Vergil's *Eclogues*, Pliny, Varro, or Columella, but instruct their pupils in the whole method and course of study," and the professors should be chosen "for solid and experimental knowledge."

Cowley had taken a great interest in the foundation of the Royal Society (*q.v.*), was an M.D. of Oxford, and wrote a poem in Latin, *Plantarum Libri Duo*, a work which shows his interest in scientific studies.

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Barnard. *American Journal of Education*, Vol. XXII, p. 209.
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COWPER-TEMPLE CLAUSE. — The famous clause known by the name of its author, Mr. Cowper-Temple, M.P., which was inserted in the English Elementary Education Act of 1870, and frequently repeated since then. Subsection (2) of the 14th Section of the Act of 1870 runs as follows: "No religious catechism or religious formulary which is distinctive of any particular denomination shall be taught in the (public elementary) school"; that is, if any religious instruction is given in such a school, it must be undenominational in character.

See England, Education in.

COWPER, WILLIAM (1731–1800). — The poet, who throws light in some of his works on school conditions in the eighteenth century. Although himself of morbid and despondent temperament, his criticisms of the defects of the contemporary schools are frequently sound. He was unfortunate in his own school experiences, and accordingly in the poem *Tirocinium; or a Review of Schools*, he gives expression to the memories of his days at a private school and Westminster. The poem is dedicated in the following terms: "To the Rev. William Cawthorne Unwin, Rector of Stock in Essex, the tutor of his two sons, the following poem, recommending private tuition in preference to an education at school is inscribed." The chief indictment which Cowper brings is the lack of moral control and moral training. If a boy shows brilliance at his books: —

> "The pedagogue with self-complacent air,
> Claims more than half the praise as his due share.
> But if with all his genius he betray . . .
> Such vicious habits as disgrace his name . . .
> Though want of due restraint alone have bred
> The symptoms which you see with so much dread;
> Unenvied then, he may sustain alone
> The whole reproach, the fault was all his own."

In *The Task* Cowper continues the topic, lamenting the decline of *Discipline* and its effects.

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CRAMMING. — A term used to describe a form of study which consists in memorizing hastily subject matter which the individual does not expect to retain permanently. Thus, a student prepares for examination a short time before the beginning of the test by learning the facts necessary to carry him through the brief interval. Criticism of this method of learning has frequently been made, and the criticism has sometimes been extended so as to include all forms of memory work. This extension of the criticism to cover all forms of memory work is not legitimate, since the essence of the process criticized is its lack of thoroughness. Furthermore, attention should be drawn to the fact that there is at times a practical demand in life for a brief retention of a mass of facts. The lawyer who prepares for a case learns a certain number of facts which he does not intend to retain permanently. The business man, undertaking a transaction, also equips himself with information which he does not intend to retain permanently. The ability to master for temporary use a large body of facts is, therefore, in some cases of value. In general, however, the work of the school is of a different type. Whatever is to be memorized should be memorized for the purpose of longer retention, and for the most part even mere memory work is not justifiable in education. H. S.

For a more complete discussion see article on Memory; Memorization.

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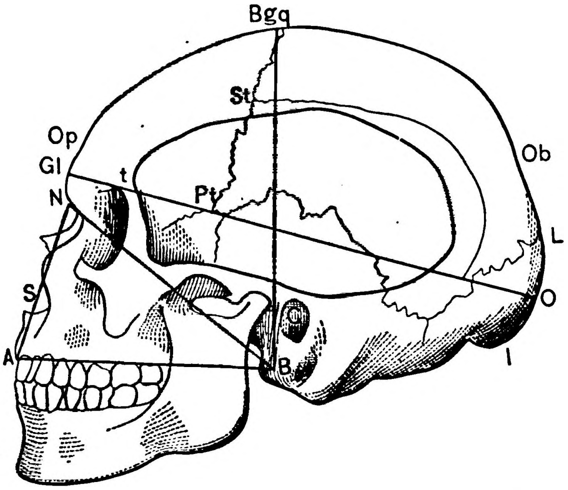
CRANIOMETRY. — A division of craniology and a branch of anthropometry which studies by means of systematic measurements the proportions and geometrical characteristics of the human skull. It affords one of the chief means of racial classification in that the marked racial differences and individual variations of skulls may be measured with accuracy of detail. The first cranial measurements of note were made by Daubenton on the situation and direction of the *foramen magnum*, but it is now generally accepted that the first to write on craniometry in a scientific manner and to emphasize racial distinctions was Peter Camper who described the "Camper facial angle" in a lecture on art at the Academy of Fine Arts, Amsterdam, 1770. Among others who have contributed to the science are Morton, Thurman, Von Baer, Virchow, Flower, Broca, Ecker, Turner, Retgius, Bertillon, Welcher, and Topinard. Among the special forms of apparatus that have been used for craniometrical measurements are straight and sharp-pointed compasses, the ordinary anthropometric compass, Broca's stereograph and craniograph, diagraph of Gavart, diopter of Lucæ, Topinard's craniophore, craniometers, callipers, and cephalometers. The last three pieces of apparatus may be used on the living head as well as the skull. The most important measurements and characteristics in studying and comparing skulls are length, breadth, circumference, height, capacity, facial angle, degree of prognation of jaw, facial index, form of the nasal skeleton, the orbital opening, and the form of the palate and dental arch.

The measurements of most general interest are those of length and breadth, which, when expressed in terms of per cent of the latter to the former, give a resulting complex value known as the *cephalic index*. The indices vary with the mode of measurement, but the points generally selected for determining the length, or antero-posterior diameter, are the nasion, globella, or ophryon in front, and the occipital point or inion behind. The width or biparietal diameter is the greatest transverse diameter above the supermastoid ridge. The resulting ratio would be $\frac{100 \times W}{L}$. When the per cent is low, the skull is long, and when it is high, short. Authorities differ somewhat in regard to the boundaries for each type of skull, but the following classification from Deniker is one of the best: dolichocephalic, less than 77; subdolichocephalic, 77 to 79.6; mesocephalic 79.7 to 81.9; subbrachycephalic, 82 to 85.2; brachycephalic, 85.3 to 86.9; hyperbrachycephalic, 87 and more.

There is a correlation between cephalic index and length of face, breadth of face, and stature. Boas has pointed out that while a cephalic index is a convenient, practical expression for the form of the head, it is not the expression of the law of direct relation between length and breadth of skull. "The relation between capacity and head diameters is found to be of fundamental importance, and among these the relation between transversal diameter and capacity is most significant. Since in measurements on the living we are unable to measure capacity of the head, it is necessary to find a substitute. It would seem that circumferences are the most available means for judging cranial size."

The circumference of the skull is taken in a horizontal plane through ophryon (sometimes) through the globella) and the occipital point. In adults the average is about 52 cm. (20.5. in.) for males, and 50 cm. (19.7 in.) for females. Extremes of 17 inches (microcephalic head) and 26 inches (macrocephalic or hydrocephalic heads) are sometimes met with in cases of idiocy. The average at birth is from 38 to 42 cm. (Sach), or, according to Holt, 35.5 cm. (13.9 in.) for boys and 34.5 cm. (13.5 in.) for girls. Many other measurements are taken to determine more accurately the form of the skull.

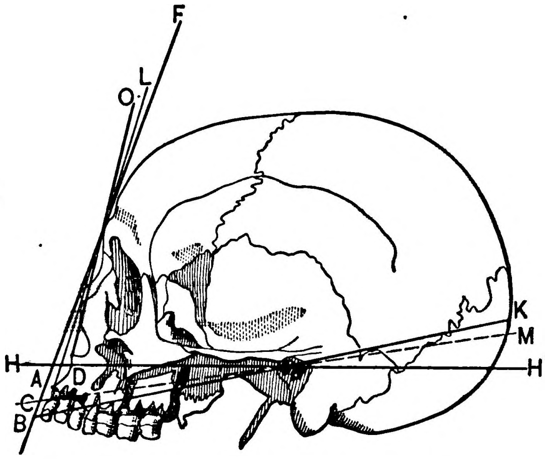


A, Alveolar Point; *S*, Subnasal point; *N*, Nasion; *Gl*, Glabella; *Op*, Ophryon; *Bg*, Bregma; *Ob*, Obelion; *L*, Lambda; *O*, Occipital point; *I*, Inion; *B*, Basion; *Pt*, Pterion; *St*, Stephanion; *GlO*, Length of cranium; *BN*, Basinasal length; *BA*, Basialveolar length; *NS*, Nasal length.

The capacity of the skull, measured in many ways, offers some indications of brain development. Morton and Broca, filling the skull with small shot, measured or weighed the shot, to determine the cubical contents of the skull. Buck, Flower, Welcher, Tiederman, and others have pursued a similar method, using white mustard seed, pearl barley, small beads, etc. As a rule, skulls ranging from 1350 to 1450 cc. are mesocephalic (American Indians, Chinese); those over 1450 cc. macrocephalic (Japanese, Eskimos); and those under 1350 cc. microcephalic (Australians, Bushmen). There is no direct evidence that the size and shape of the skull are closely related to intelligence, but there are limitations beyond which the relationship is quite apparent. This is noticeable among many types of mentally deficient children.

There are four principal facial angles which may be seen in the accompanying diagram. The angle of Camper is the oldest. The angle of Geoffrey Saint-Hilaire and Cuvier (1795) has been abandoned. The angle of Jules Cloquet (1821) is a mean between the preceding two, and is probably the most important. The angle of Jacquart is the fourth.

In general, the facial angle serves to indicate the prognation of the upper jaw, which is significant in the anthropological classification of races. When the index is above 103, the skull is prognathous; when below 98, orthognathous; when between 98 and 103, mesognathous. The facial index is the relation of the breadth of the face to the length. The length is usually taken from ophryon or nasion to the mental point. The long face, or dolichofacial, has an index below 90, and the brachyfacial above 90. When the lower jaw is absent, the superior facial index is taken, and 50 is used in place of 90, the length being taken from nasion to the alveolar point. The nasal index is of much value, since there is little difference in size and shape between that of the skull and the living head. The height is measured from the nasion to the subnasal point, and the greatest transverse diameter of the anterior portion of the nasal aperture is taken as the width. Skulls with an index below 48 are leptorhine; from 48 to 53, mesorhine; and above 53, platyrhine. (Quain.) The orbital indices are of less value for racial comparisons. The forms of the palate and dental arch are compared for the palatal-maxillary index. The alveolar index (Flower) is the ratio of the length from the basion to the alveolar point, to the length from basion to the subnasal point or nasion. Many other diameters, angles, and indices have been marked with more or less uniformity for purposes of anthropological and craniological investigation. B. T. B.



HH', Horizontal of Camper; *FF'*, Facial line of Camper; *FAH'*, True angle of Camper; *FBK*, Angle of Geoffroy Saint Hilaire and Cuvier, its vertex at the edge of the incisors; *LCM*, Angle of Jules Cloquet, its vertex at the alveolar border; *ODH'*, Angle of Jacquart, the sub-nasal point; *OD*, Facial line of Jacquart. (Topinard, P., *Anthropology*, p. 41, London, 1890.)

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CRATES OF MALLOS. — A grammarian of the second century B.C. He was head of the Pergamene Library, which was founded by Eumenes II. It is probable that he was responsible for the lists of authors drawn up for the library and the prominence given to prose authors, especially orators. He wrote an allegorical and a critical commentary on Homer; some notes on Hesiod, and commentaries on Euripides and Aristophanes. In thought he belonged to the Stoic School of grammarians, and followed the view of Chrysippus that language was based on irregularity, the view of the anomalists, as against the view of Aristarchus and the Alexandrines that it is based on regularity and analogy. Crates founded a school of which Panætius, the Stoic philosopher, was the most eminent pupil. At some time between 169 and 159 B.C. Crates visited Rome, and, being detained there as the result of an accident, he seized the opportunity to give lectures on formal grammar and literature, and was influential in arousing an interest in literary study among the Romans.

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CREATIVE SYNTHESIS. — This term is employed by Wundt (*Outlines of Psychology*) to indicate that the processes of apperception result in forms of thought which are in no-wise explained by the elements of which these thoughts are composed. By combining the elements of experience a new product is put forth which is higher in its type than any other elements. Thus a work of art is a product of creative synthesis. An invention is a creative synthesis.

See Constructive Imagination.

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Wundt. *Outlines of Psychology.* (London, 1897.)

CREDITS. — See College Requirements for Admission; College and Secondary Schools, Articulation of; Marks, School.

CREIGHTON UNIVERSITY. — OMAHA, NEB. — See Jesus, Society of, Educational Work of the.

CRESCENT COLLEGE FOR WOMEN, EUREKA SPRINGS, ARK. — A school for girls and young women. Primary, preparatory, academic, musical, and art departments are maintained. Degrees of Bachelor and Master of Arts are granted.

CRETE, EDUCATION IN. — A melancholy interest attaches to the island of Crete, which shared in the glory of Greek civilization and in the ruthless splendor of Venetian rule before it fell under the Ottoman power, which held sway for four and a half centuries (1221 to 1660). Rescued from alien despotism and internal insurrection by the intervention of the four powers, Crete was constituted an autonomous state in 1898, subject nominally to the suzerainty of the Sultan. Through the right granted to the King of Greece in 1906, to propose the High Commissioner, the island has finally recovered political relations with Greece. It comprises, in an area of 3365 square miles, a population of 310,185. Of this number 269,848, or 87 per cent, belong to the Greek Church and are Hellenistic in traditions, sympathies, and tendencies. The Mohammedans, who are mostly Greek converts or their descendants, number 33,496, or 10 per cent of the population; the remainder are Jews and foreigners.

In accordance with the constitutional provisions, public instruction forms one of the five departments organized for the administration of public affairs; but as a consequence of the conditions which prevailed during the long period of Turkish rule, education is practically under church control. The Greek Church is represented by a Metropolitan, whose see is at Candia, and seven bishops, who keep careful watch over the religious training of the children. Secular instruction is assimilated to the system which prevails in Greece. Primary education, which is by law compulsory for all children six to ten years of age, is provided by parish schools, of which the large majority pertain to the Greek Church. There is freedom, nominally at least, in religious matters, and the Mohammedans conduct their separate schools without interference; but the laws require that there shall be at least thirty Mohammedan children for every public school teacher of that faith. Official statistics for 1907–1908 give a total of 640 primary schools. As regards religious affiliations, 621 of these schools were Christian, that is, pertained to the Greek Church. They had a total of 36,149 pupils (27,714 boys; 8435 girls). The remaining nineteen schools, with an enrollment of 1957 pupils (1243 boys; 714 girls), pertained to the Mohammedan faith.

The institutions for secondary education comprised four complete gymnasia, four gymnasia of inferior order, and twenty-one progymnasia, all modeled after German types. (See Germany, Education in.) They enrolled 4174 pupils, of whom 435 were girls, and employed 75 teachers. For higher education, Cretan students repair to the University of Athens or to other Continental institutions.

The government contributes for the support of schools about 750,000 drachmas ($144,750) annually. A. T. S.

See Greece, Modern, Education in.

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CRETINISM. — A form of low-grade imbecility or idiocy, either endemic or sporadic, characterized by a peculiar stunting of growth and associated with the absence or disease of the thyroid gland. It is endemic in widely scattered localities throughout the world, but occurs most frequently in certain valleys and slopes of mountainous regions of Europe — in Switzerland, France, Spain, and Italy. Such an endemic has been reported in this country in certain parts of California, Vermont, Minnesota, Ontario, and elsewhere. The causes are not well understood, but are thought to be due to unhealthy conditions arising from the climate, soil, or water supply, coupled with the likelihood of some accumulation of hereditary weaknesses such as might, for example, arise through intermarriage in isolated communities.

Sporadic cretinism (cretinoid idiocy) is a relatively rare condition, due to the absence of the internal secretion of the thyroid gland. "The symptoms of cretinism in most cases make their appearance during the first year, but are sometimes so slight as not to be noticed until the seventh or eighth year. The general appearance of the cretin is striking, and so characteristic that when once seen the disease can hardly fail to be recognized. The body is greatly dwarfed, and children of fifteen years are often only two and a half or three feet in height. All the extremities, the fingers and the toes, are short and thick. The subcutaneous tissue seems very thick and boggy, but does not pit upon pressure like ordinary œdema. The facies is extremely characteristic. The head seems large for the body; the fontanel is open until the eighth or tenth year, and it may not be closed even in adults; the forehead is low and the base of the nose is broad, so that the eyes are wide apart; the lips are thick, the mouth half open, and the tongue usually protrudes slightly; the cheeks are baggy, the hair coarse, straight, and generally light-coloured. The teeth appear very late . . . and are apt to decay early." (Holt.)

The condition is one of mental and physical enfeeblement; walking and speech are acquired late, and "when fifteen or eighteen years old the cretins appear like children of two or three years." Emotionally, they are good-natured, seldom troublesome, and may show some affection. The treatment of sporadic cretinism, as of myxedema in general, by use of the thyroid glands of animals, furnishes one of the most brilliant chapters in medicine. "In acquired or operative myxedema thyroid feeding may be considered established as a curative treatment. In cases of myxedematous retardation, its results appear equally brilliant. In sporadic cretinism it is capable of producing the most marvelous improvement, which is complete in proportion as it is adopted early in life. In endemic cretinism its effects are beneficial, but as yet its proper value is not established." (Church and Peterson.)

The chief difference between the sporadic and the endemic seems to be one of degree, physically the only distinction being the presence of the goitrous enlargement in the former. "The isolated examples of cretinism that are now found in this country and in England can hardly be called true cretinism, as lacking its intensity of coarseness and stupidity. These are, therefore, better classed as demi-cretins or *cretinoids*." (Barr.)

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CRIB. — A colloquial expression for a theft. Hence, in common usage, anything used or copied by a person without due acknowledgment to the author. In college slang, any copied material used to cheat with in a test, recitation or examination. A "pony," or literal translation of a classic author, becomes a "crib" when used against the wishes of the teacher of languages. The term is also used in English school slang to refer to the person who "cribs."

See Honor System.

CRICKET. — The national game of Great Britain. It is played in every part of Great Britain and all the British colonies. Like other modern ball games, cricket has been developed from simpler games in which the characteristic was to strike a ball with a stick. The essential features of the present game have been traced to the game of *creag*, played in England during the thirteenth century. As in football, many efforts were made to suppress cricket. Edward III declared it unfit for any but the lower classes, and Edward IV made it illegal. In 1748 it was declared by law that cricket was "a very manly game, not bad in itself but only in the ill use of it by betting more than ten pounds on it." It soon became very popular, and was played by all classes, and by the end of the eighteenth century it had become the national game. Cricket is played by practically all students in every educational institution, from the elementary school to the university. It is played on a very smooth grass field by teams consisting of eleven players. The ball used is of cork bound with string and covered with cowhide; it weighs four and a half ounces and measures nine inches in circumference; the bat is thirty-eight inches long and four and one-half inches wide.

Many eminent educators, physicians, and statesmen have written on the value of cricket as a factor in physical and moral education. A great advantage of cricket is that, like golf, it may be played by young and old. Most of the American school and college sports are so violent that few of them can be indulged in by men in middle life, with the result that exercise is neglected by American men soon after they leave college. Not so with Englishmen, who continue to derive beneficial exercise and recreation from cricket practically all through life.

Cricket has never flourished in the United States, outside of a few clubs made up largely of Englishmen. At Harvard and a few other colleges cricket teams have been maintained by English students, but there is no indication that the game will be taken up by American students. The great popularity of baseball is undoubtedly responsible to a large extent for the lack of interest in cricket by the American students. G. L. M.

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CRIME AND ITS RELATION TO EDUCATION. — See Education and Crime; Criminality among School Children.

CRIMINAL PSYCHOLOGY. — Many tests go to show that the habitual criminal has marked psychical characteristics which differentiate him from the ordinary individual. The study of these individual peculiarities of criminals has been regarded by some as a special science.

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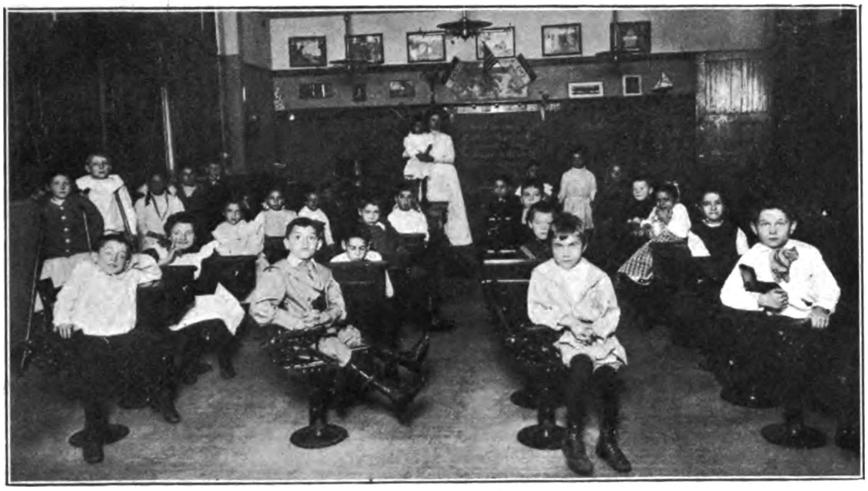
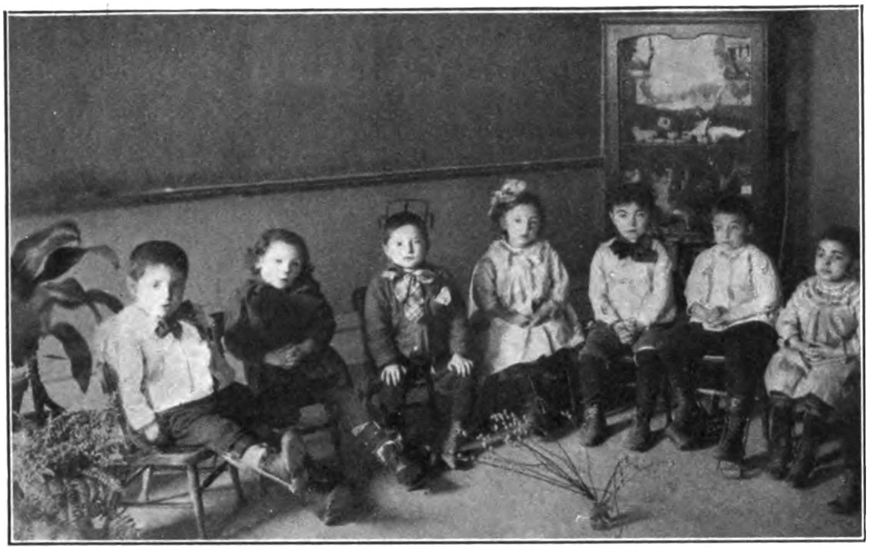
CRIPPLED CHILDREN, EDUCATION OF. — **Germany.** — The first attempt to educate crippled children in schools especially adapted to them was made in 1832 by Mr. Kurz, a citizen of Munich. He had observed the sad lot of the crippled children in the common schools, where they were the butt for the jokes of the healthy scholars. He had observed, also, the condition of the crippled children when, upon leaving school, they must choose an occupation. Then, as now, trades which required physical strength were closed to them. In addition, the superstitious fear that these poor unfortunates would bring bad luck prevented their being taken into homes where lighter employment might have been found for them; so there was nothing left for them but to become a prey or burden on society. Mr. Kurz's plan was to give the crippled children a specially good education and an opportunity to learn a trade with which they could earn a livelihood. The Kurz Foundation had in the beginning many difficulties to contend with. However, King Ludwig I of Bavaria took an interest in the school for cripples, and transformed it into a state institution, thus making it independent of persons and securing its existence for all time. The Munich school for cripples was a model for nearly all the later foundations which have been created in Germany during the last century. It is a peculiarity of this school that its pupils receive not only instruction, but also food, clothing, and lodging. They are taken from the parental home, and return to the family only for a few months during the vacation. In the Munich state institution pupils are first admitted between the ages of eleven and fourteen, and remain for three years. The board of a crippled child for the three years amounts to 1400 marks. That the instruction is well-planned, giving the children a really definite education, is seen from the fact that out of the pupils who attended the Munich Institute from 1877 to 1902, 90 per cent were able afterwards to earn their livelihood. In Germany there are in all thirty-nine institutions, with 3371 beds; but the number of crippled children in the whole of Germany is 98,263. One of the most important of the newer schools was organized in Nowawes near Potsdam in 1886, and has an attendance of 200. The distinguishing mark of this school is its department for the education of children who are blind, deaf, dumb, and crippled. Of these especially afflicted children there are 215 in Prussia alone.

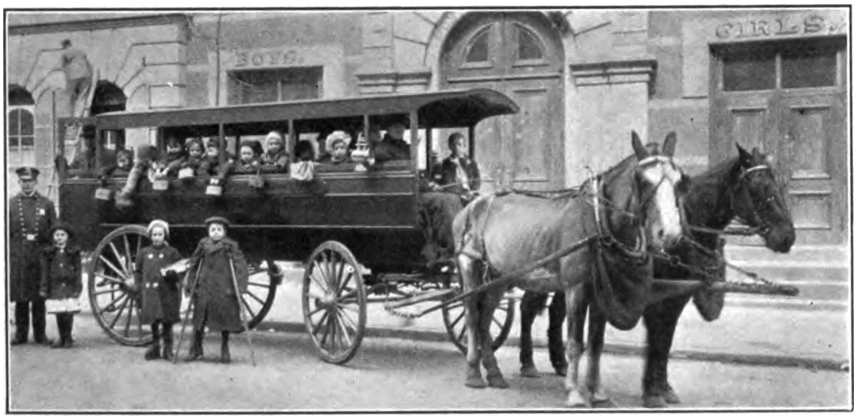
Denmark. — The model school of Europe for crippled men, women, and children was founded in Copenhagen in 1872, and is still the only one in Denmark. In this school the aim is to fit the pupils to go out into the world and take positions that will render them self-supporting. The institution has five divisions, namely: (1) *Workrooms.* (*a*) Bandage, mold, and corset making, saddlery, forging, and shoemaking are taught, the articles made being for the use of the cripples. Here are numbers of pupils without hands, wearing appliances which enable them to hold a tool and steady the material worked upon. (*b*) School of handicraft and manual work, consisting of wood carving, bookbinding, brush-making, joinery, dressmaking, weaving, needlework, housekeeping, cooking, and office work. The age of the pupils varies from fourteen to twenty-six. (2) *Child's School,* where the rudimentary branches are taught. Emphasis is laid upon



A Primary Class: in Adjustable Seats and Desks.



The Kindergarten Class: Listening to a Story.



The School Wagon.

SPECIAL CLASSES FOR CRIPPLED CHILDREN.

the musical training. (3) *Clinic,* where patients are treated and bandages, wooden legs, special corsets, boots, etc., are supplied. These are made by the pupils in the workshops, at the order of the surgeons in attendance, and of some former pupils who have become teachers. (4) *A home,* where pupils from the country live during apprenticeship. The furnishings of this home are made in the different workshops by these children. (5) *Recreation home,* at the seaside, for the most diseased patients, accommodating forty-four in 1909.

Sweden. — Industrial schools for adult cripples were established at Gothenburg and Karlskrona in 1885, at Helsingborg in 1887, and in Stockholm in 1879 and 1892. Crippled children are not admitted to the public schools, but special teachers are supplied by the school board to teach them in their homes after school hours. A most careful supervision is exercised over the physical condition of the public school pupils. In the case of defects, such as curvature of the spine, round shoulders, or faulty posture, the teacher sends the children to the royal gymnasium, where curative treatment is given free of charge to the poor. Stockholm has two schools supported solely by private contributions, one the "Society in Aid of the Deformed and Infirm," opened in 1892, an industrial school caring especially for thirty-five adults, enabling them to provide for themselves as far as possible; and the "Eugenia Hemmet's," opened in 1879 with an enrollment of 190, admitting both adults and children. This has the best equipment of any school in Europe. Here the stress is laid upon a good general education rather than a training for the trades. It makes provision in the classroom for a number of the children who are in bed.

Norway. — The large school for cripples is the "Sophie Minde" in Christiania. This school stands especially for manual training, and shows that the most helpless cripples are capable of the finest handicraft. Wonderful examples of self-dependence are seen: a man without fingers carves most intricate designs in furniture. By means of her teeth a girl with no arms makes most elaborate and exquisite lace.

Great Britain. — The schools for crippled children are a recognized part of the system of public instruction. They are in buildings of their own, and are equipped with furniture and appliances especially adapted to the needs of the crippled child. Each school has an ambulance or two especially constructed at great expense to admit children on stretchers and in invalid chairs, and all are conveyed to and from their homes. A nurse or a paid attendant accompanies each ambulance. When the ambulance arrives at school, the children are given cod liver oil and medicines prescribed by their physicians, and at the morning recess crackers and milk. The largest number of schools is in London. Here there is provision for the instruction and physical improvement of crippled children which is far in advance of that of any other country. The first effort to provide for special education for crippled children in London was in 1886, when there was formed an Invalid Children's Aid Society, which made many experiments. Then Mrs. Humphry Ward became interested, and induced the London School Board to take up a scheme in 1898, which she had worked out at the Passmore Edwards Settlement in Farvistock Place. She had obtained the use of some ground-floor rooms leading out into a beautiful garden, with a nurse to superintend, and generously presented an ambulance to convey the twenty-five children to and from the settlement. As this effort was very successful, the board, in February, 1899, promptly put through a plan providing the teacher and school furniture. Thus the first "Invalid Center" was established. Since then twenty-three centers have been formed, with over 1880 children on the rolls. Mrs. Ward's school has been the model upon which the other centers have been formed. In making her experiment, Mrs. Ward saw that no school could be successfully carried on without a midday meal for the pupils, and she organized the "Crippled Children's Dinner Society" to provide a hot dinner daily. A good hot dinner of meat, vegetables, bread, and pudding is provided for 2*d.* The London School Board furnishes the kitchen, firing, and cook. The cook is responsible to the head teacher for the proper performance of her duties. The dinners are under the care of the above-mentioned society, one representative manager being elected from each school. The managers meet monthly, accounts and menus are examined, and every case of inability to pay 2*d.* is carefully considered. Free dinners are given only under exceptional circumstances, and it is a noteworthy fact that, although these children come from the lowest and poorest slums of London, in the report of 1907 only 4 per cent of free dinners were given. The "after training" of these children is under the care of the same society that controls the dinners. As the child nears sixteen, which is the age for leaving school, his achievements are carefully noted and brought before the committee, and work suited as far as possible to his particular requirements is found. In the Royal National Orthopedic Hospital, and in the Alexandra Hip Hospital, where special cases are admitted for very long periods, classes are formed under teachers of the London Board Schools. Thus these children do not retrograde mentally, in spite of prolonged hospital treatment, and are fit to take their places again in the "Special Centers," when they are discharged. The "Guild for the Brave Poor Things" at Chailey, is an invalid craft school founded by Mrs. Kimmins, and is also under the inspection of the Board of Education. Here much attention is given to athletics, the boys playing football, the girls cricket, and both performing on all kinds of apparatus.

Next in importance to London, as regards schools for cripples, is Liverpool. The special schools are carried on under the Elementary Education Act of 1899, which empowers but does not require local authorities to provide for the instruction of physically and mentally defective children. Three of these provide for both the physical and mental defectives. Among other English cities the following have established similar schools: Leeds, one center, with sixty children; Birmingham, two centers, with a hundred children; Bristol, one center, with eighty children; Manchester, a residential school, with thirty children; Oldham, one center, with sixty children; Kingston-on-Thames, one center, with twenty children; West Kirby, Cheshire, a convalescent home school, with thirty-three children.

The especially noticeable feature of the Edinburgh school is the emphasis placed upon the surroundings of the school. The Willowbrae School has beautiful gardens and playgrounds. In the main playroom the south wall opens like a big door of a barn to admit fresh air and sunshine. In the winter this building is utilized for a playroom as a protection from the storms; in the summer, when necessary, as a classroom. In Glasgow there are four well-developed schools, the Freeland, Bridgeton, Finneston, and Hayfield schools, all in special buildings, or old buildings remodeled to fit the needs of these children. The Hayfield school is especially attractive; for though it is a separate new building, it is considered part of the large Hayfield School for normal children, which is a model building throughout. All chairs and reclining sofas are fitted to the children, and thereby add to the children's comfort. The Aid Society assists with the dinners.

United States. — *New York.* — In America the work for crippled children was begun in New York in 1861 by Dr. Knight and his daughter in their home on 6th Street. Out of this small combination of school and hospital there grew two years later the new Hospital for the Ruptured and Crippled on 42d Street. This was the first institution in America to employ teachers for crippled children. The Visiting Guild for Crippled Children of the Ethical Culture Society was started in 1892, and it is through their efforts that many children returned from hospitals were sought out and education brought to them. Following closely upon the work of the Guild was the Children's Aid Society. This society was the first to open schools. Special committees were formed to look after the providing of extra nourishment and special orthopedic apparatus. Provision was made for professional oversight and attendants to carry children up and downstairs. The Aid Society in one year cared for over four hundred disabled children in some four of their schools. In 1898 Rev. Dr. J. Winthrop Hegeman founded "The Guild for Crippled Children of the Poor." The work grew in importance until, in January, 1903, the managers of the guild and its many auxiliaries brought about a coöperative conference. Among the guilds were: (*a*) the William Davis Free Industrial School, established in 1900; (*b*) the Crippled Children's East Side Free School, organized by Mrs. Daniel P. Hays in November, 1900; (*c*) the Day Home and School for Crippled Children, established Feb. 26, 1902; (*d*) the Crippled Children's West Side Free School, established in 1904. The second and third of these have since joined forces with the Board of Education. The second has a new model building erected by the "Lehman Foundation." The first has disbanded, and the children attend special classes in the public schools. The last is still an independent school. Many other organizations which are run independently are Hospital Schools, a branch at White Plains, the New York Home for Destitute Crippled Children, the Rhinelander School of the Children's Aid Society, the House of the Annunciation, the Association for the aid of Crippled Children, and the Darrach Home, founded by Dr. Darrach, one of the pioneers of this work.

There were many private endeavors to care for disabled children up to 1906. Then one of the first steps toward solving the problem of the education of these children by the public schools of New York City was made. The Board of Education joined forces with two private guilds, (*a*) and (*c*). The school equipment and teachers were supplied by the Board of Education; the buildings, transportation, nourishment, and general physical care were looked after by the guilds. This attempt proved successful, and a further advance was made a year later, in 1907, when classes for crippled children were added to the regular public schools whenever rooms were available. At present there are twenty-three classes for crippled children in the public school system of the city of New York. Children from five to sixteen are now in attendance, coming at nine, bringing a noonday lunch, and leaving at two. The expense of three stages for the transportation of these children is borne by the Board of Education, and of others by philanthropic institutions. The regularity of attendance, often 100 per cent, and the general progress made both mentally and physically, justify beyond doubt the existence of these schools. It is estimated that 18,000 crippled children are being treated at the various hospitals in New York City to-day. About 450 crippled children are enrolled in the public schools in Manhattan, and about 300 more in private schools. Through the efforts of the "Driving Fund Association," these crippled children are given a ride at least once a week to Central Park and the different parks and gardens of the city, thus enabling them, while receiving benefits of fresh air and sunshine, to get glimpses of the outside world of nature and of life, and generally to enlarge their limited experiences. Another feature of the work in New York is " The Association of Public School Teachers of Crippled Children in the City of New York." This group of women is banded together to extend education to the crippled child and to study diseases most common to these afflicted ones, so as to be of service to this most neglected side of our education to-day.

Chicago. — The only other city in this country that has taken over the education of crippled children in a public way is Chicago. In January, 1899, the first school was established as part of the Chicago public school system. An act was passed authorizing school districts managed by boards of education to establish and maintain schools or classes for crippled children as part of the public school system, and authorizing payment therefor from the state common school funds. One school in a one-story model building having no stairs is set aside entirely for crippled children. In another part of the city a department in a regular school is set aside for crippled children. The total enrollment for 1910 in these two schools is 195. Hot meals are served to the children, and the stages for transportation are supplied by the Board of Education.

Boston. — Through the efforts of Dr. Bradford and Dr. Thorndike, who became acquainted with schools for cripples in Europe, the first school for the cripples and deformed of Boston was started in July, 1894, at the home of Dr. Thorndike, with eleven pupils and one teacher for primary and grammar studies. Later a room was given in a church by the rector, Dr. Kidner, and in Oct. 3, 1904, a new model building was completed which is still the model building of this country if not of the world. Its equipment is complete in every way to meet the needs of the helpless and unfortunate child. This school early in its career aimed to pay pupils for their work in the industrial departments, and the printing room was the first to prove its earning capacity.

Philadelphia. — The Widener Memorial Industrial Training School for Crippled Children was founded by Mr. P. A. B. Widener as a memorial to his wife and son. The endowment of this foundation is $3,000,000. As soon after admission as the physical condition permits, every pupil receives two or more hours of schooling a day; the time increases as the pupils advance in the grades. Every child who has had no previous training is placed in the kindergarten. Pupils who show decided mental ability will receive a higher education in schools and colleges of Philadelphia. Likewise opportunities will be afforded to pupils to receive a business education, to study typewriting, bookkeeping, telegraphy, library work, secretary work, etc. A brass band, consisting of twelve horns and two drums, furnishes music for entertainments. There are at present (1910) a hundred children in attendance. As yet there are no public schools for the care of crippled children in Philadelphia although about fifty cripples are at the " Home of the Merciful Saviour," started in 1882, and there is also a school for colored crippled children established in 1887, the " House of St. Michael and All Angels."

Massachusetts. — The only state to provide an institution for the care and education of the crippled and deformed children of the commonwealth is Massachusetts. This is in Canton, near Boston, and promises to be the model of its kind. The institution was opened on Dec. 1, 1907. The work of organization progressed as rapidly as circumstances permitted, and on Jan. 14, 1908, when one dormitory was completed, four children were transferred from the State Hospital. During the year, 104 were admitted, 70 boys and 34 girls.

It is a growing conviction that the state has no option but to provide for the crippled child and to give him a chance of leading an independent life. He must not be left to the exclusive care of philanthropy, tender though that be, for he is a future citizen, with all the rights which inhere in that relation.

The History of the care and education of crippled children is traced briefly in the following chronological list, giving the date of founding of the more important homes, hospitals, and schools: 1840, Württemberg; 1845, Stuttgart; 1851, London (private crippled girls' school); 1853, Paris; 1862, London (cripples' private nursery); 1864, Zurich; 1865, London (Industrial Home and National Association for Destitute Children); 1863, Stuttgart; 1870, London (Dartmouth Home for Boys); 1871, Turin; 1872, Copenhagen; 1873, Milan; 1874, Dublin (Home for Cripples); 1874, Philadelphia (Hospital); 1878, Genoa; 1879, Baden; 1879, Mantua; 1879, Stockholm (Eugenia Hemmet's); 1882, Philadelphia (Home of Merciful Saviour); 1882, Verona; 1885, Gottenburg; 1885, Stuttgart; 1886, Potsdam, Nowawes; 1887, Helsingborg; 1887, Philadelphia (Home of St. Michael and All Angels [colored]); 1889, Magdeburg; 1890, Helsingfors, Finland; 1892, St. Petersburg; 1892, Hanover; 1892, Chicago (industrial home); 1892, Stockholm; 1892, Christiania; 1894, Boston (industrial school); 1897, St. Paul's (Minnesota State Hospital); 1898, New York City (guild organized for care of cripples); 1898, Altona; 1898, London School Board; 1899, Chicago (public schools); 1900, Arnheim, Holland; 1900, New York State Hospital; 1900, Mecklenburg; 1902, Baden; 1903, Westfalen; 1903, Budapest; 1903, Munich; 1903, Philadelphia (Widener Memorial School); 1904, Westphalia; 1905, Arnstadt; 1906, Munich; 1906, Public Schools, New York City, joined guilds; 1907, Public Schools take over work of city. E. M. G.

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CRITIC. — Broadly speaking, any person who systematically estimates the worth of educational practice. More particularly, the name applied to the supervisor of practice teaching in normal schools or teachers' training classes, the " critic teacher " who has the supervisory charge of apprentices or student teachers.

See Supervision of Teaching.

CRITICISM. — In the supervision of teachers a conference in which the supervising official presents a specific judgment of the work of a teacher. Such a criticism may cover a single lesson, a series of lessons, or the entire activity of the teacher.

See Supervision of Teaching.

CRITICISM, ART OF TEXTUAL. — See Textual Criticism.

CRITICISM, THE FUNCTION OF EDUCATIONAL. — The function of criticism in education, as in art, history, and other fields, is to make rational estimates of worth. In education the standard of worth is not beauty, as in art, or truth, as in history, but development. The worth of any given educational condition or practice is to be determined in terms of its ability to provide for moral, social, and individual growth. The methods of administration as well as those of teaching are to be judged by this standard. It is especially necessary in a complex field such as education that criticism be wholesome and rational. Its judgments should be delivered with reference to all the conditions and ends involved. Judgments passed upon an educational situation from a specialized and narrowed point of view may be useful for the special purposes of scientific thought, but they are not the poised, inclusive, and stable estimates of true criticism. The critical function aims to see the worth of a practical or fine art in terms of every consideration involved. Its point of view is that of the whole, and its resulting judgments are, therefore, wholesome in their effects upon conduct.

The method of examination in criticism is rational. Mere intuitionalism or impressionism does not constitute criticism. It may provoke tentative judgments, but these must be reëxamined rationally in the light of well-established principles, before the estimate is to be regarded as a critical estimate. Much of the current fault-finding with education is neither wholesome nor rational, and is therefore not to be regarded as the product of a true critical approach. The traditionalist who measures the worth of the present courses of study in terms of their conformity or nonconformity to traditional procedure, and quite without reference to contemporaneous needs, is bound to overestimate the value of such formal subjects as reading, writing, and arithmetic. His standards of criticism are restricted and his approach narrow. A blind devotion to the past, rather than an open-minded, rational examination of social forces and educational machinery, determines his valuation. Similar shortcomings are frequently manifested in the complaints of both laymen and teachers. The manufacturer with a special interest in industrial education and the student of child life are likely to over-emphasize their own points of view to the exclusion of others equally valuable. The result of partial and prejudiced views of the educational situation is a series of uncritical judgments that are the basis of much faddish and futile reform, in which enthusiastic radicalism is followed by reaction. It is the function of a true educational criticism to arrive at judgments of school effectiveness by means of a logical examination of the actual school situations upon which a systematic series of educational principles is brought to bear.

Such a systematic series of educational principles is not to be derived solely from the special sciences that have an application for educational practice. The knowledge afforded by such special fields as biology, physiology, psychology, sociology, and ethics is inadequate to explain all that is involved in education. These specialized, scientific, and accurate studies are still fragmentary in their contribution. They present bodies of principles, derived from a narrow range of phenomena, in isolation, as it were, unmodified in any complete way by those of other fields. Education is not merely an application of several sciences; it is an institutional and personal art, with a point of view of its own, with valid traditions and habits evolved out of the trial, success, and error of its own intuitions and inventions, its reflections and experiments. These gross extensive experiences of historic and contemporaneous educational practice are as valuable in their way for education as the more refined and intensive investigations of modern science. Together they form the fund of fact from which educational generalizations or principles are derived. It is this body of inductions that constitutes the standards of criticism. A consistent philosophy of education determines, systematizes, and states them; a rational educational criticism applies them to specific practices. While the function of criticism is immediately theoretic in that its direct purpose is to arrive at estimates or valuations of efficiency, its ultimate influence is practical. The practical force of criticism is exerted through educational supervision, which attempts to reconstruct practice through applying the judgments of criticism. All effective supervision therefore rests upon sound criticism.

H. S.

See Supervision of Teaching.

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CROATIA AND SLAVONIA. — Provinces under the sovereignty of Hungary with autonomy in home affairs, justice, and public instruction. Area, 16,423 square miles. Population (1900), 2,516,304.

Historical. — The history of education in Croatia and Slavonia is in general similar to that of Hungary (*q.v.*), but a few events preceding the eighteenth century have peculiar significance as related to the present time. A college or gymnasium was opened by the Jesuits at Agram, the seat of the present university, in 1607, and after the suppression of the order (1773) was conducted by the Franciscans. A law enacted during the reign of Maria Theresa (1774) provided for a normal school at Agram, which was opened in 1776. Not until 1845 were general regulations providing for the instruction of children throughout the province issued. These regulations were modified by laws enacted in 1874, 1878, and 1888, according to which the schools are now conducted.

Administration. — The administration of all schools is vested in the provincial ministry of public instruction. Local supervision is intrusted to school committees composed of the mayor of the respective town or village, a pastor, a teacher, a patron of the school (that is, a landholder, who by virtue of his estate is obliged to contribute to the support of the school), and from two to five other members chosen from among the parents of children in attendance upon the schools.

Primary Schools. —The primary schools of Croatia and Slavonia, like those of Hungary, are classified as elementary, and higher. In some of the cities and larger towns maternal (or infant) schools have been opened. These numbered twenty-three in 1900. The graded elementary schools have from two to five classes; but the majority are ungraded and employ but one teacher. The total number of primary schools in 1900 was 1371. The various languages of instruction, and the number of schools using each, were as follows: Croate, or Serbe, 1303; German, forty-one; Magyar, twenty-two; and two each, Ruthenian and Slovack. Children may attend school at the age of six years, but the compulsory school age is from seven to twelve in the primary elementary schools and from twelve to fifteen, in the higher primary schools. The law specifies that every school shall have a school garden for instruction in elementary agriculture. Textbooks are uniform throughout the provinces.

Teachers and Teachers' Training. — There are six normal schools in the two provinces, four for men and two for women. The course of study is arranged for four years, and is both academic and professional in character. Teachers are appointed to positions by the central school authorities upon recommendation of the local committee. They receive an initial salary of 800 crowns ($168.40), and 100 crowns additional for every five years of service. They are entitled to a pension after six years' service, which amounts to full salary after forty years' service. The teachers of the two provinces are organized into a national teachers' association which publishes a pedagogical review, *Napredak* (*Progress*), and a journal for youth, *Smilje*.

Higher Instruction. — The secondary schools comprise nine gymnasia, nine realgymnasia, and five realschulen. There is also one lyceum of secondary grade for girls. The Scientific Academy at Agram, which has been in existence since the time of Maria Theresa, was raised in 1874 to the rank of a university with faculties of theology, law, and philosophy. The number of students for the year 1907–1908 was as follows: theology, 117; law, 877; philosophy, 471; pharmacy, 73. The number of professors and teachers was eighty-seven. The total expenditures of the university were 515,230 crowns ($104,591). The library contains 59,115 volumes. Besides the university there are four seminaries for the training of theological students. These are, however, of lower rank than the university, and do not grant degrees.

Special Schools. — In addition to numerous lower industrial and trade schools, there are the following secondary technical schools: four schools of agriculture, four commercial; one school of forestry, and one nautical school. The law provides that every school district (*Bezirk*) must set aside twenty crowns ($4.06) annually for the support of school libraries. In 1900 the total number of volumes in libraries of this class was 422,000. Scientific study and investigation are encouraged by the South Slavish academy of science and art, founded in 1866, with a library of 40,000 volumes (1908), and the Croatian society of natural science, with a library of 4000 volumes. In common with Hungary, the provinces of Croatia and Slavonia have borne the shock of conflict between the forces of the Eastern and Western world. But while social disorder and political instability have been their fate, public education has become organized and is rapidly drawing them into the current of Western progress. The material resources of the country are developing through the application of science and technical skill, and, at the same time, the moral transformation of the people is taking place, chiefly through the influence of Christian missions. A. T. S.

CROCHETING. — See HOUSEHOLD ARTS.

CROMWELL AND EDUCATION. — See COMMONWEALTH AND EDUCATION.

CROSBY, ALPHEUS (1810–1874). — Educator; educated at the Phillips-Exeter Academy and the Andover Theological Seminary. He was for several years professor in Dartmouth College; for two years agent of the State Board of Education in Massachusetts, and eight years (1857–1865) principal of the State Normal School at Salem. Author of *First Lessons in Geometry* and a series of Greek and Latin texts, and one of the editors of the *Massachusetts Teacher*. W. S. M.

CROUP. — A term used loosely for a variety of diseases of the trachea and larynx, in which there is interference at the glottis with respiration. The so-called "true" or membranous croup is probably in most cases diphtheria. The so-called "false" croup is a disease of the larynx and trachea not resulting in the formation of a membrane, but causing at times spasm of the glottis.

See DIPHTHERIA.

CRUELTY TO CHILDREN. — See CHILDHOOD, LEGISLATION FOR THE CONSERVATION AND PROTECTION OF; HUMANE EDUCATION.

CUBA, EDUCATION IN. — **Historical Development.** — The modern system of education which is now developing in Cuba is affected by influences that were operating in the island for at least two centuries preceding the final overthrow of the Spanish power. The history of the island down to the Revolution of 1867 is practically the same as that of the other Spanish possessions in America, save that Cuba suffered more deeply and for a longer time the oppressive tyranny of arbitrary power.

Prior to 1790 several attempts were made through private initiative to establish elementary schools for the common people, since the administrative authorities did nothing in this direction; even in Havana the establishment of elementary schools in the early part of the eighteenth century was due to private philanthropy. At the same time secondary education was of a shallow character; schools which were little more than primary were given the title of academies or institutes and prepared for the university. Latin and singing seemed to be the only subjects to which attention was paid. Efforts to improve education were thwarted by the royal government. In 1603 the municipality of Havana offered to provide classes in grammar, and in 1607 Bishop Juan de las Cabezas Altamirano founded the Tridentine Seminary, the citizens offering to pay a part of the annual expenses. In 1724, after a long struggle dating from 1656, a Jesuit college of San Ignacio was established in Havana, supported by a contribution of $40,000 from one of the citizens. This institution was united with the older college of San Ambrosio. Since the sons of wealthy families were compelled to seek higher education abroad, efforts were made to secure the establishment of a university at home, and succeeded in 1728. The new university was intrusted to the Dominicans, who controlled it up to 1842, when education in Cuba was secularized.

A new epoch began in 1790 with the administration of Don Luis de las Casas, whose name is held in grateful remembrance by the Cubans. Under his influence the first literary periodical in Cuba was established, and the *Sociedad Econ**ó**mica* (sometimes called *Patri**ó**tica) de Habana*, which has been the first mover in all the advances in material interests and education in the island. This society was charged by royal order with the care of education in Cuba. An investigation was at once begun and disclosed a deplorable condition. The society established several free schools for the poor in the face of clerical opposition; in 1816 it secured a government grant for primary instruction. In its movement for higher education the society was able to collect money to found a chair in chemistry, which was filled in 1819 by Professor Don Jose Tasso. In 1811 the chair of philosophy was taken by Felix Varela, who introduced modern philosophy and modern doctrines, thus carrying forward a movement begun in 1797 by Caballero, who first departed from the old Aristotelian philosophy. In 1818 the society established a chair in economics, supported by voluntary contributions. The study of Spanish law replaced the Roman digests. At this period a large number of newspapers and periodicals were published, owing to the liberty granted to the press. The result of the progressive measures was seen in the new literary movement from 1820 to 1842, when committees on history and literature were formed within the *Sociedad Econ**ó**mica*, and collected a valuable library. Throughout this period the royal government contributed little to progress in education. In 1863 a general reform was effected, by which public instruction was divided into primary, secondary, superior, and professional branches. An interchange of degrees and professors between Spain and Cuba was sanctioned, and in 1878 the professorate in the colonies and the peninsula were made one body. In 1880 a law was passed, as a result of a memorial drawn up by the minister for the colonies on the unsatisfactory condition of public education, regulating superior and secondary instruction and coördinating the branches in Cuba with the same grades in Spain established by royal decrees of 1874 and order of 1875. One article of the law authorized the establishment of a secondary institution in the capital of each Cuban province at the expense of the province or municipality, with a subvention from the Governor-General from the budget of the island. In capitals, where there were no public secondary institutes, colleges of the religious orders might be substituted by the Governor-General, with the advice of the council. But the degrees granted by these private institutions were to be verified, as only the degrees of public institutions were recognized. The want of funds, the indifference of the royal government, and the protracted struggle against Spanish domination prevented any substantial progress in education under the law of 1880.

Present System. — On Jan. 1, 1899, the Americans took possession of the island and the American military governor assumed, in regard to education, the functions of the Spanish Governor-General, who had represented the King of Spain. At that time there was a nominal system of public instruction based upon the law of 1865 as modified by the law of 1880, and efforts were at once made to put it into operation. As an inducement to teachers to prepare for the work, it was ordered that salaries for the summer months should be paid to those only who would attend some authorized summer school. Out of this requirement grew the unique plan arranged by President Eliot of Harvard University and Dr. Frye for bringing a body of Cuban teachers to the states to attend the summer school at Harvard free of expense. On June 30, 1900, the military governor of Cuba issued special regulations respecting public education. They provided for the appointment of a Commissioner of Public Schools, and a board of superintendents, consisting of the chief Superintendent and provincial superintendents, one for each province of the island. For the local administration of schools, the island was divided into districts of the first and second classes and municipal districts, and provision was made for the election of a school board in each district. The order required that an annual school census should be taken, made the instruction of children between the ages of six and fourteen obligatory upon parents and guardians, and provided, further, that teachers' institutes should be held in each province of the island, the attendance of teachers upon the same being compulsory. The superintendents were directed to decide upon a plan for the examination and certification of teachers, to take effect within the year. This order was enforced so far as practicable, and, according to Dr. Frye, the first Superintendent, the number of schools increased from 200 in 1899 to 2000 in 1900, and the number of pupils from 4000 to 100,000.

The formal transfer of the island to the people of Cuba was made by the President of the United States in 1902, and the charge of the system of public instruction passed to the newly organized government. The insurrection of 1906 interfered seriously with the work, but marked advance has since been made. The principal features of the system established by military order have been preserved by the school law of July 18, 1909, and according to official statistics, there were in operation, at the close of the school year 1908–1909, a total of 2175 schools, with 3683 teachers and an enrollment of 132,740 pupils.

The most important recent measures pertaining to the public schools are the efforts at grading and the increase in the number of special branches taught. Kindergarten exercises, sloyd in wood, and physical training were introduced in 1905, and in 1906 lace work, sewing, and pattern work, drawing and modeling, sloyd in cardboard, sloyd in metal, and music. The normal education of the teachers is receiving serious attention, and an elaborate plan for high schools has been matured by the board of superintendents. In the last budget of the Cuban republic a credit of $42,000 was allowed to provide for an increase from fifty to seventy in the number of teachers of English in the public schools, and it is intended to make a proportionate increase in their number each year, should this experiment prove successful, until the force is adequate for all the public schools. There are to be two supervisors of teachers of English; one for the province of Havana with a salary of $1500 a year, and the other for the rest of the island at a salary of $1620 a year. A law of July 10, 1909, authorizes the establishment of a school of agriculture in each of the six provinces of the island, an appropriation of $270,000 for the building and equipments of the schools, and an additional sum of $112,680 for the current expenditures as soon as the schools are definitely installed. Public secondary education is provided in the institutes, one in each province, which prepare pupils for the degree of Bachelor. The professors, by virtue of the law of July 11, 1906, have had their salaries increased, special appropriations have been made for the purchase of scientific material, and examination methods have been rendered less cumbersome and complicated for both professors and scholars. The State contributed the sum of $268,860 for the maintenance of the six provincial institutes during the past year. The School of Arts (manual) and Trades, which the military government of intervention raised to a high degree of excellence, has been amply provided for. An appropriation of $41,000 has been made for this institution, which provides both day and night instruction, and turns out skilled workmen and artisans. The estimated appropriation for public instruction for 1908–1909 amounted to $4,275,794.

The University of Havana. — The old constitution of the University of Havana remained until education in Cuba was secularized in 1842, when the theological, Aristotelian, and scholastic system of university instruction, a relic of the Middle Ages, gave way to literary, and, later, to the scientific tastes and requirements of modern times. The degrees in arts, sciences, jurisprudence, medicine, surgery, and pharmacy were retained, while those in theology and canon law were abolished. There are at present three faculties, letters and sciences, medicine and pharmacy, and law, a restriction of degrees which indicates how completely the course of instruction has been modernized. The faculties are subdivided into special schools, in which the particular subjects pertaining to the general branches are taught. Thus the faculty of letters and sciences comprises the " schools " of letters and philosophy, of pedagogy, of science, of electrical engineering and architecture, and of agronomy. In the school of letters and philosophy are taught Latin and Greek, philology, literature, history, psychology, moral philosophy, and sociology. The school of pedagogy comprises pedagogical psychology, the history of pedagogy, methodology, and drawing. The details of the studies given in the yearbook, or *Memoria Anuario*, published by the university, show the manner in which they are carried out.

In 1905, 516 students matriculated in three faculties of the university, of whom 165 were in the faculty of letters and science, 209 in the faculty of medicine and pharmacy, and 142 in the law faculty. In 1907 the university received $357,358 from the state government.

The State contributed $16,060 toward the School of Painting and Sculpture, at which over 500 pupils are enrolled. The national library was founded by General Wood. Its personnel has recently been reorganized and increased, and to-day its shelves contain over 40,000 books. The state annually contributes $11,660 toward its support.

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CULTURE AND CULTURE VALUES. — The term " culture " is used in educational literature with a very wide range of connotations. In its most superficial sense (which perhaps is also its most popular) it means possession of a certain kind of knowledge and ability which marks off the person in question as having had superior educational advantages, together with a certain social ease and grace of speech that enables the person to display this knowledge to good special effect. In this sense culture is the mark of a gentleman in the conventional sense of that word; it includes knowledge and ready use of the refinements of social manners, familiarity with literary and historic allusions, and ability to speak, or at least to read, one or more foreign languages. Culture here means practically a kind of intellectual and artistic polish which may indicate genuine refinement or which may be an external veneer. In either case, it implies a contrast of social classes, not necessarily of rich as distinct from the poor, but at least of superior social opportunities.

A more elevated aspect of a certain portion of the conception of culture just noted is found in Matthew Arnold's famous definition of culture " as acquaintance with the best that has been known and said." Culture in this sense describes the humanistic ideal of education. As opposed to naturalism (*q.v.*), humanism (*q.v.*) insists that the truly educative factors are to be found in contact with the past history of mankind, especially as past humanity has left an expression of itself in literature and art. Natural science is of importance in education, from this point of view, not because it tells us about our present environment, but because certain great discoveries and laws must be known, if we are to be acquainted with the best of what has been said and thought in the past. Politics is profitably studied from this point of view, not so much as having a direct bearing upon the administering of present conditions, but as a testimony and record of the workings of collective human nature.

This conception of culture is historically not so much a direct descendant of the humanism of the Renaissance as a fruit of the German reaction against Rousseau's "return to nature" as a standard of thought and life. While Rousseau's influence in Germany in the latter half of the eighteenth century was tremendous, it took shape not only in the romantic individualism of that day, but also in a deliberate attempt to justify art and science against the attack which Rousseau, in his first prize essay, made upon them. ¶ *Bildung*, the conscious and deliberate formation of human personality through assimilation of the spiritual products of the past, was made the standard and goal of education, as over against the appeal to spontaneous, native, but raw and crude instincts and impulses which, in contrast with *Bildung*, defined *Nature*. As Schiller, Goethe, Hegel, and other German writers became influential in England, their main thought as to the nurturing influence of past humanistic products upon present life was embodied in the term "culture." The three chief elements in culture, as summed up by Matthew Arnold, are that it is (1) an inward condition of mind in opposition to dependence upon external and mechanical appliances; (2) a harmonious expansion of all our powers in contrast to onesidedness of ideas and over-absorption in some special pursuit, and (3) a social conception aiming at the improvement of society as a whole and requiring the subordination of individualistic traditions and aims.

The broadest conception of culture as an educational ideal is reached by developing the last-named factor in the humanistic definition — the social. The questionable point in the humanistic notion, as expressed by Arnold, is not in its end, but in its exclusive reliance upon literature and history as means of reaching this end. The preponderance of the literary factor in the education with which the typical humanist is acquainted blinds him to the fundamental importance of knowledge of nature as a necessary condition of reaching both all-round individual development and an equable social improvement. ¶From the broader point of view, culture may be defined as the habit of mind which perceives and estimates all matters with reference to their bearing on social values and aims. While it is opposed to the purely utilitarian (or practical in its narrow sense), this opposition is in behalf of a more universal use — namely, social service. While it is opposed to an abstract, onesided scientific specialism as an educational ideal, culture requires acquaintance with the natural conditions and forces upon which social well-being necessarily depends. In other words, manual and industrial activities at once acquire a cultural value in education when they are appreciated in the light of their social context, in their bearing upon social order and progress. Natural science acquires a like cultural import when it is pursued not simply as a means of getting information about an external world, but insight into the indispensable rôle of science in general, and natural facts in particular, in the guidance and amelioration of the common social life.

Using this conception of culture as a criterion, we readily place the so-called "culture value" of studies in relation to their information value, their utility value, and their disciplinary value. As these distinctions are usually drawn, they are independent of one another, and apply to different groups of studies, geography, for example, being supposed to have chiefly information value, mathematics chiefly disciplinary value, technical skill (in writing, reading, manual training, etc.) utility value, while literature and history are preëminent for culture value.

On the basis of a true, or social, conception of culture, information, use, and discipline are indispensable ingredients of culture, or else they have no legitimate place in any general educational scheme. Culture is the social insight and spirit to which useful skill, knowledge of fact, and trained mental power must all be made to contribute. Where they are isolated from active participation in culture, utility becomes mechanical routine, or else skill in purely egoistic pursuits; information becomes an accumulation and memorizing of a mass of miscellaneous facts that have no bearing upon conduct, and discipline becomes a formal gymnastic of specialized mental habits or "faculties." On the other hand, culture when isolated tends to become a purely external polish and refinement, a mark of an invidious class distinction. We are not dealing here with an abstract theoretical point; no problem is more urgent in contemporary educational practice than promotion of a curriculum and methods of instruction that shall combine the ideals, separated since the time of Aristotle (see ACTIVITY) of a liberalizing nurture of the individual and fitness for a vocation of social service. J. D.

See COURSE OF STUDY, THEORY OF; HUMANISM AND HUMANISTS; LIBERAL EDUCATION; NATURALISM; PHILOSOPHY OF EDUCATION.

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CULTURE EPOCH THEORY. — The fundamental ideas of this theory are (1) that there is a general parallelism between the development of the human race and of the individual; that (2) this parallelism is of fundamental importance for the selection and arrangement of the materials of the course of study (*q.v.*); that (3) the appropriate basis of the content of study at each period of child growth is the culture products (literature especially) of the corresponding period of race development. The general idea has never been better stated than by Goethe in the following words: " The youth must always begin anew at the beginning, and as an individual traverse the epochs of the world's culture."

The theory has been independently reached from a number of different points of view. Three of these modes of approach may be especially signalized. (1) The philosophic-historic. The reaction against the rationalism and the individualism of the French and German enlightenment of the eighteenth century led many German thinkers to a vivid appreciation of the part played by the social institutions and traditions of the past in bringing individuals to their present status, and of the necessary rôle of past culture in the further development of a well-founded personality. Against the " Return to Nature " of Rousseau the necessity of nurture by culture (*q.v.*) was insisted upon. Formal rationalism in its zeal for reform and progress would make a *tabula rasa* of the past, and regarding government and religion as mainly conscious inventions to keep the masses in subjection to the interests of a few, would start afresh on the basis of an equality and liberty of individuals demonstrated by pure reason. Against this Herder, Lessing, Goethe, and Hegel emphasized the continuity of institutional life, and the fact that history contained implicitly a deeper rationality than that of the isolated self-consciousness of individuals. Moreover these writers upheld the application of the idea of evolution in one form or another to the history of humanity, and thus elaborated the notion of a developing series of stages through which mankind has progressively passed in traversing its course to the full unfolding of its corporate destiny. From these conceptions they drew, with varying degrees of explicitness, the conclusion that individuals go through the same general course of development and attain their fullest and most harmonious development in the degree in which they repeat the progressive stages of the race. (2) Other writers (again mostly German) approached the matter from the educational side. The aim of education is to elevate the child to the perfect cultural plane of present civilization. Because of the contrast between the immaturity and narrowness of the child's experience and the complexity and richness of present civilization, this problem of elevation must be attacked indirectly and gradually. The child cannot directly assimilate or appreciate the highest and best in the life about him. He can rise progressively to it by living through the significant and valuable factors of the past stages out of which the present has evolved; the earlier being the simpler are better adapted to the child psychology — to his apperceptive masses and his interests. Herbart and his followers presented this point of view. (3) The discovery (in embryology) that the individual growth (the ontogenetic series) recapitulates the evolution of animal life (the phylogenetic series) has been employed to give the doctrine a scientific biological foundation, or at least a support by analogy.

Before considering the doctrine critically we may note some of the attempts which have been made to apply the theory to educational practice. Some pedagogical writers have laid stress upon the complete and almost unconscious absorption of the individual in the group as the characteristic mark of the earlier stage of development of the race and the child; have selected individualistic reaction and protest as the sign of the second period, and voluntary and conscious loyal reattachment of the individual to the interests and well-being of the social group as the key to the final stage. Others have fixed upon three stages of intellectual development as the common element: first, the predominance of emotional imagination, — the mythical, animistic phase of mind; second, the development of a matter-of-fact interest, expressed in tendency to observe, to collect, to make utilitarian constructions; third, the emerging of conscious reflection, characterized by interest in abstraction and generalization. Still others have fixed upon typical industrial periods in the evolution of humanity, carrying with them a great knowledge of natural energy and law and increased ability to utilize them: *e.g.* (*a*) hunting and fishing, (*b*) nomadic and shepherd life, (*c*) agriculture, (*d*) use of metals and beginnings of manufacture, (*e*) universal commerce and intercourse. They have then sought for corresponding psychological traits in the development of the child during the years of school age.

The curricula based upon these various methods of interpretation have agreed more closely than the diversity of the point would perhaps have led us to anticipate. Myths and fairy tales afford the appropriate nurture for the earliest period. Robinson Crusoe and stories of the Biblical patriarchs make a transition to the study of tribal and national heroes and founders of states; modern history and literature (especially the development of the particular state to which the child belongs) of the later years. The German schemes are also complicated by the necessity of exerting the scheme on the side of instruction in religion and in the Old and New Testaments.

Regarding the theory in general, it must first be heartily acknowledged that it makes practically the first attempt to treat the curriculum, especially in its sequence, upon other than conventional, or formal and logical grounds. Educational theory is indebted to the doctrine for the first systematic attempts to base a course of study upon the actual unfolding of the psychology of child nature, and at the same time to connect this psychological growth with indispensable sociological considerations. This fact being cordially recognized, certain important qualifications need to be introduced regarding the use of the doctrine to determine the appropriate materials and best sequence of the studies in the curriculum. (1) The primacy of the *contemporary* social life and relations of the child must be mentioned. Even if the parallelism of child growth and social development could be made out in a general way, it would still remain true that *educationally* the existence of certain types of culture in the past is no reason for emphasizing the materials of those periods in present education. The child at best has only a short time to pass through what the race has taken long ages to traverse; and it may well be that certain psychological tendencies in the child (supposing that they do correspond roughly to the dominant traits of some past historic period) need to be slurred over, or at least short-circuited, rather than emphasized or brought to consciousness. Hence (*a*) no past period should be selected except as it serves to increase the child's insight and appreciation of significant and valuable features of present civilization. The criterion of selection and emphasis is in contemporary, not in past civilization. (*b*) Moreover, the starting point, the ground of departure, must always be sought in activities and materials with which the pupil is already directly familar in his present social environment. The motive and the "apperceptive masses" of dealing with the past must be found in problems and materials with which children are confronted in their ordinary social life. Finally (*c*) when excursions are made from the present to the past, pains should be taken to see that the knowledge of the past does not remain isolated, but is promptly reapplied to insure a better appreciation of the present social environment. In short, the child is not, educationally speaking, to be led *through* the epochs of the past, but is to be led *by* them to resolve present complex culture into simpler factors, and to understand the *forces* which have produced the present. (2) The present psychological structure and tendencies of children must be used as criteria for estimating the educational bearing of the past periods, not *vice versa.* That is to say, we must not assume that because certain activities and interests are presented in the history of the race, they are therefore now presented and significant in child experience. We must make an independent examination of the structure and growth, physical and mental, of children, and having ascertained the operation of certain needs and capacities look to the history of the race to find out appropriate material for supplying the needs and nurturing the capacities. (3) The doctrine, as usually expounded, underestimates the value of the *processes* which have marked the development of the race, and exaggerates the importance of *products.* Ziller, for example, stated that the culture history of the race is deposited chiefly in the literary masterpieces in which the various epochs have manifested themselves; and in general the more ardent devotees of the culture epoch doctrine have tended to make literature and history the centers of the course of study. Two fundamental exceptions must be taken to this conception. In the first place, literary products cannot be adequately understood except with reference to the activities which have manifested themselves in artistic expressions. To isolate the literature of Greece and Rome from the social, the economic, political, and scientific, activities which lie behind that art is to deprive the latter of much of its vitality and significance. In the second place, emphasis upon past products at the expense of processes is defective in promoting an understanding of the present. The method tends toward a static conception of society; it fails to present the forces which have made society progressive and which render it still a moving, changing, dynamic process. If the activities shown in industrial struggles, of invention and scientific discovery, in the conquest of nature and in changes of social organization require primary emphasis, the literary products, while precious documents of education, should be treated as consummations of these active processes, not as the primary and essential educative material. J. D.

See Aqcuired Characteristics; Apperception; Correlation; Herbart; Culture and Culture Values; Course of Study.

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CUMBERLAND UNIVERSITY, LEBANON, TENN. — A coeducational institution established in 1842, as a college of liberal arts and a preparatory school. There are now maintained the college of arts and sciences, engineering school, law school, school of pharmacy, and the conservatory of music. Students are admitted either by certificate from approved schools or by examination of the Association of Colleges and Preparatory Schools of the Southern States. The degrees of A.B., B.S., A.M., LL.B., C.E., B.M., and Ph.C., are conferred on fulfillment of the requirements. There is a faculty of nineteen members.

CURIOSITY. — Sometimes described as an instinct. Among animals, as, for example, in some of the monkeys, curiosity appears as a natural disposition to examine every accessible object. There is doubtless some justification for the description of curiosity as a natural instinct, as every animal is disposed to secure as complete stimulation for all of his senses as circumstances will permit. Thus, there is an inborn reflex tendency to look in the direction of any sound which is heard so as to add visual experience to auditory, as there is a natural reflex tendency to reach after objects that attract the visual attention so that there may be added to the visual impression a series of tactual sensations from the object. The higher an animal's senses and the more varied its activities, the larger the number of objects that will thus attract attention and arouse what may be legitimately regarded as natural sensory curiosity. After the analogy of these natural tendencies, it is possible to cultivate in children artificial interest in objects to which their attention is directed. Acquired curiosity follows in the train of acquired experience, for as soon as experience in any given line has accumulated, there is a disposition on the part of the individual to increase his information about the objects with which he has been in contact. The whole matter of curiosity belongs, accordingly, in the same general category as the same general problem of attention and interest.

See Attention; Interest; Instinct.

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CURRENT EVENTS, STUDY OF IN SCHOOLS. — This subject may be defined as a study which has for its object the teaching of present events of political, commercial, industrial, social, religious, and artistic importance. As a separate subject it is to be found in the curricula of very few colleges and schools. Its earliest advocates had in mind its close relation to courses in civics or citizenship, and advised its inclusion in the school curricula for that reason. Papers read before the National Educational Association in 1889 and 1892, urged the teaching of current events in the schools. The arguments were based on the following grounds. The study of civics with reference to the affairs of the day develops Americanism of the best type. In order to learn to appreciate America's institutions, nothing is of greater value than the comparisons made possible by the study of current happenings in other countries. Its study trains the pupil to read the newspaper and thus to keep abreast of the times, and connects school life with home and the world. The teachers themselves are benefited by such a course because it forces them to keep in touch with matters of contemporary importance and gets them away from their oracular methods. It gives both pupils and teachers an acquaintance with a vocabulary common in the political and economic phases of the world's activities and enables them to become discriminating readers of the daily newspapers.

Notwithstanding these or similar pleas, the teaching of current events has remained a neglected one in the school and college curricula. What has been done has depended almost entirely upon the personal predilection of some superintendent, principal, or teacher. However, in answer to a demand from some New England schools the publication of a small sheet entitled *Current Events* was begun in Springfield, Mass., in the late nineties. This comprised extracts taken from various newspapers which were used by pupils in schools or by school Current Events Clubs to paste in scrapbooks. An improvement on this was found in the *Little Chronicle*, published in Chicago, which is a newspaper for young people. In this the news items were written for the young. Terms or items which might prove difficult were fully explained. In 1909 the People's Institute (*q.v.*) in New York — a civic organization — began the publication of a *Civic Journal* containing accounts of current events relating mainly to the City of New York. This journal was designed for use in high schools, colleges, and civic clubs. In addition to these publications designed primarily for the teaching of events of present moment, the current magazines are usually made use of.

Within the last few years there has been a widespread demand for the study of more modern and recent history in both schools and colleges. It seems strongly probable that the study of current events will form a part of such courses. Economics cannot be intelligently studied without constant reference to current events, and the Committee on Civics of the New England History Teachers' Association and the Committee of Five of the American Political Science Association have both come out emphatically in favor of the study of newspapers and current magazines in connection with the work in civics. J. S.

See CIVICS; ECONOMICS; ETC.

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See the articles and reports mentioned above.

CURRICULUM. — See COURSE OF STUDY, THEORY OF; COURSES OF STUDY.

CURRICULUM, ELEMENTARY. — See COURSES OF STUDY.

CURRY, JABEZ LAMAR MUNROE (1825–1903). — Educator, born in Lincoln County, Ga. on the 5th of June, 1825. He was graduated from the University of Georgia in 1843 and Harvard in 1845. For many years he was professor in Richmond College and president of Howard College, Ala. From 1881 to the time of his death he was connected with the Peabody educational fund and was actively engaged in educational reform in the South. Author of *History of the Peabody Educational Fund* (1898) and of numerous essays on educational conditions in the South since the Civil War. He died at Asheville, N.C., on Feb. 12, 1903. W. S. M.

CURTAINS. — See SHADES.

CURVE, GRAPHIC. — See GRAPHIC CURVE.

CUTANEOUS SENSATIONS. — The sensations received from the skin are now put at four, the mechanical senses of pressure and pain, the thermal sensations of warmth and cold. Each is apparently a distinct sense quality with a distinct nerve terminal, as is established by the different distribution of the sense qualities, both for the separate spots and the wider groupings of the qualities. These qualities are treated under the separate heads. The vaguer cutaneous qualities, such as tickling and itching, wet and dry, etc., are either complexes of these qualities or complexes of some of these qualities with vascular or muscular sensations; they do not have distinct sense organs, and are not new qualities. W. B. P.

CURTIUS, GEORG (1820–1885). — A distinguished German philologist and author of textbooks. Born in Lübeck, he studied at the universities of Bonn and Berlin (1838–1842), was appointed professor of classical philology in the University of Prague (1847), whence he went to Kiel (1854) and later (1862) to Leipzig. He was the first to use the results of comparative philology for the study of the classical languages in the higher schools of Germany. His *Griechische Schulgrammatik* (*Greek Schoolgrammar*), first published in 1852, was translated into many languages, and is still used in many schools. Other works of his are: *Grundzüge der griechischen Etymologie* (*Elements of Greek Etymology*, 1858–1862) and *Das Verbum in der griechischen Sprache* (*The Verb in the Greek Language*), 2 vols., 1873–1876. F. M.

CURVATURE OF THE SPINE. — See KYPHOSIS; SCOLIOSIS; SPINAL CURVATURE.

CUSTOM. — Custom is for social life what habit is for individual life, namely a principle of organization, continuity, and efficiency. The problem of the relation of custom to habit is similar to the general problem of the relation of society and the individual. The individualistic philosophy starts with habit as built up in an individual, and treats customs as due to the spreading of this habit by example, inculcation, etc., to other individuals. If a sufficiently large number of individuals acquire the habit we have a custom. This view accounts without doubt for some of the facts, but is very onesided. Most of the important habits of the individual are dependent for their origin and growth upon prior customs in society, *i.e.* language, polite manners, and social conventions, and a large part of the content of morality. Hence the fundamental position of custom in educational practice. Not only does the individual teacher tend to form his own habits of teaching on the basis of the models to which he has himself become accustomed, but the materials and ideals of instruction are derived in the main from the customs of the social group of which he is a member. In savage and barbarian societies and in some types of civilized societies (*e.g.* China and Ancient Egypt) the entire educational procedure falls within the scope of this category. The whole aim of education is to reproduce as a habit of the individual the customs of the group to which he belongs; all deviations are looked upon as immoral or even sacrilegious. As a result (to quote Grote) "Nomos (Law and Custom) King of all" (to borrow the phrase which Herodotus cites from Pindar) exercises plenary power, spiritual and temporal, over individual minds; moulding the emotions as well as the intellect, according to the local type . . . and reigning under the appearance of habitual, self-suggested tendencies."

Even when, as in progressive modern states, custom loses its complete supremacy, it remains one of the chief standards, or norms, of educational practice. As socially handed on from generation to generation, it becomes tradition; and our tendency to ignore the influence of tradition as a controlling factor is itself very largely due to the fact that when we begin to reflect, to invent, and to project new methods and aims, tradition has already done its work so completely that we take it for granted without thinking about it, so that we deliberate and project within limits set by custom. At the same time, individual variations from custom must be encouraged in a society which has progress as one of its ideals. One of the most delicate problems of school organization and of individual teaching is the adjustment to each other of the two factors of social habit and individualistic departures. Variations are encouraged by the contact of groups of different traditions and customs; where, as in the United States, pupils represent different races, nationalities, religious and social conventions, the attrition of custom is very great. While the situation is favorable to growth of independence and initiative, and doubtless counts as a large factor in the versatility, ingenuity, and adaptability of the American habit of mind, there is also danger of loss of all regulative standards and of the development of lawlessness and caprice. The public school, more than any one agency, has to solve the crucial problem of promoting genuine individuality and at the same time conserving the factors of continuity and coherence of action and belief that are supplied by custom. J. D.

CUTLER, CARROLL (1829–1894). — Educator; attended Phillips Academy, Andover, and Yale. He was professor of philosophy and ethics in Western Reserve College (1860–1871), and president of that institution from 1871 to 1886. Author of *History of Western Reserve College* (1876) and *Lectures on Ethics* (1877). W. S. M.

CUTLER, TIMOTHY (1683–1765). — Educator; graduated from Harvard College in 1701, and was elected the third president of Yale College in 1719, but in 1722 " he was induced in consequence of reading the works of a number of late writers in England, to renounce the communion of the Congregational churches, and the trustees therefore passed a vote excusing him from all further services as rector of Yale College, and requiring of future rectors satisfactory evidence of the soundness of their faith in opposition to Arminian and prelatical corruptions." W. S. M.

CYRIL OF JERUSALEM (c. 315–386). — Church Father and Bishop of Jerusalem. His *Catecheses* (345) are of great value for the insight which they give into the educational methods of the time, and for the light which they shed on dogmatics, liturgies, the Canon of Holy Scripture and the manners and customs of the early Christian doctrine and practice, treating exhaustively of the creed and sacraments and including all that a Christian was then expected to know and believe. They are the best indication of the quiet, solid, systematic work done by the early Church in her catechetical (*q.v.*) and catechumenal schools (*q.v.*). W. R.

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CYTOLOGY. — See Botany.

CZERNOWITZ, THE IMPERIAL-ROYAL FRANCIS JOSEPH UNIVERSITY OF. — This institution in the province of Bukowina, Austria, was opened on Oct. 4, 1875, the day that marked the one hundredth anniversary of the union of Bukowina with Austria. It includes faculties of Greek-Oriental theology, law and political science, and philosophy, the latter being expanded in 1876 by the establishment of a division of mathematics and natural science. The library contains about 110,000 volumes. The Bukowina Provincial Museum, located in Czernowitz, was organized in 1891. During the winter semester of 1909–1910, 940 students were in attendance on the university. The language of instruction is German.

DABOLL, NATHAN (1750–1818). — The author of the first American textbook in arithmetic; born in 1750. He was an instructor in navigation, and is said to have had 1500 different students under his charge. His *Schoolmaster's Assistant* (1799) was for many years the only textbook in arithmetic used in American schools. He died at Groton, N.Y., Mar. 9, 1818. W. S. M.

DAILY PLAN. — See Plan, Lesson.

DAILY PROGRAM. — See Program, School.

DAKOTA WESLEYAN UNIVERSITY, MITCHELL, S.D. — A coeducational institution established in 1885 under the auspices of the Dakota Annual Conference of the Methodist Episcopal Church. An academy, college of liberal arts, and schools of education, commerce, music and elocution, and a summer school, are maintained. Students are admitted on certificates or by an examination, the requirements for which are equivalent to a high school course. Degrees of bachelor are given in arts, philosophy, science, literature, on completion of the courses and at least one year of residence; the master's degree is also conferred on one year of resident or two of nonresident work. The faculty includes twenty-seven professors and instructors.

DALE, DAVID (1739-1806). — Manufacturer and philanthropist. He was the founder of the village of New Lanark in Scotland, where he planted the first cotton mill. Robert Owen (*q.v.*) became Dale's son-in-law. Although Dale was opposed to the movement for which Owen stood, he took a deep interest in education. He was the founder of one of the earliest night schools in Great Britain for the children who were obtained from public charities and employed in his mills. But however well-intentioned Dale's system was, it could not succeed with children of a very tender age, who worked in the mill from six in the morning to seven in the evening. Owen, who gives an account of Dale's work in *A New View of Society*, says, " This labour through the day, and their education at night, became so irksome, that numbers of them continually ran away."

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DALE'S METHOD. — A systematic method for teaching reading, devised by Miss Nellie Dale and presented in a volume *On the Teaching of English Reading.* It is one of several phonetic systems current in England. Stress is laid upon giving an adequate foundation in oral language prior to the beginning of reading itself. Conversational lessons are used to develop the speech of children, and the children are encouraged to discriminate among the more obvious differences of sound found in the consonants and vowels. The material for the first actual reading is carefully composed in order that consistency between spelling and pronouncing be maintained. Anomalies of spelling and sounding are presented later, after the child has acquired some power and confidence in reading. The only phonetic signs used are colored letters, and the use of these is restricted to the primers or first books. In this system, vowels are indicated by red letters, "voiced consonants" by black, " voiceless consonants " by blue, and silent letters in light yellow. H. S.

See READING, TEACHING OF.

D'ALEMBERT, JEAN LE ROND. — Born in Paris in 1717, and died there in 1783. He was the illegitimate son of the Chevalier Destouches, and was brought up under the care of a glazier's wife, named Rousseau, for whom he cherished the greatest affection throughout his life, and with whom he lived in circumstances of frugality and simplicity the greater part of his life. His name was assumed. His education was received first at a boarding school, where he soon mastered all the studies. In 1730 he entered Mazarin College, kept by the Jansenists (*q.v.*), where he early distinguished himself as a mathematician, though theology was supposed to be his ultimate study. After leaving the college, he pursued his studies in the higher mathematics privately, with great success and satisfaction to himself. He also studied law and medicine, upon the advice of friends; but though he was admitted to the bar in 1738, he abandoned all idea of a professional career and settled down to the life of a private citizen and student, a decision which was facilitated by the annuity which his father left him, and which was increased in later years by the esteem and affection of Frederick, King of Prussia, and David Hume. He did not seek honors, and lived an obscure life for many years; but after his fame spread he might have occupied the chief seats in the academies of Europe. He preferred the simple régime of the house of the glazier's wife. It may hence be inferred that his tastes were far from fashionable. As a matter of fact, he was simplicity itself, a great lover of independence, and withal most abstemious in habit.

His principal works were in the domain of mathematics, toward the advance of which he made lasting contributions. His *Traité de Dynamique* (1743) greatly simplified the solution of complex dynamical problems, while his brilliant *Réflexions sur le Cause général de Vents* (1746) won for him the friendly patronage of Frederick, King of Prussia, and the offer of the presidency of the Berlin Academy. In philosophy his chief work was the contributions made, in association with Diderot, to the *Dictionnaire Encyclopédique*, and the *Eléments de Philosophie* (1759), in which he discusses the principles and methods of the principal sciences. D'Alembert's religious views, expressed in the former work, brought down upon him the wrath of the Jesuits, against whom also his essay entitled *Sur la Destruction des Jesuits* (1765) was directed. For educational philosophy, in the technical sense, his importance is less significant. His psychology may be evaluated by stating that he distinguished the human faculties into memory, reason, and imagination. Following out this classification, which he considered true, he arranged all sciences under three heads corresponding to this threefold division of mental phenomena, namely: history, which is the science of memory; philosophy, which is the science of reason; poetry, which is the science of imagination. The arrangement is not without its suggestive utility, but it is based on a false assumption. No science is the product of any one faculty to the exclusion of all others. In pedagogy his influence has been practically nil. Yet he was obviously a true educator, and did much, by his independent and kindly character and by the simplicity of his life, to set a true example to the pampered literati and hangers-on in the philosophical circles of his day. His essays on literature and research were, moreover, a direct contribution to the cause of the freedom of study. (Por. opp. p. 307.)

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BERTRAND. *D'Alembert.* (Paris, 1889.)

DALHOUSIE UNIVERSITY, HALIFAX, N.S. — Founded in 1818 as Dalhousie College, and opened in 1838. University powers were obtained in 1841. The faculty of medicine was organized in 1868, and merged into the Halifax Medical College in 1875; the faculty of science was first organized in 1874; a school of mines was opened in 1902; in 1906 the faculty of engineering was established. Students are admitted on passing the matriculation examination. Degrees are conferred in arts and science, music, law, medicine, surgery, and dental surgery. There are fourteen professors and forty-one lecturers.

DALLAS COLLEGE AND LACREOLE ACADEMY, DALLAS, ORE. — A coeducational institution, founded in 1900 under the auspices of the Oregon Conference of the United Evangelical Church. A three-year academic department, collegiate, commercial, and musical courses are offered. Admission requirements represent about eight points of high school work. Degrees are conferred in classical, scientific, elementary, and musical courses. There is a faculty of eleven members.

DAME SCHOOLS. — **England.** — Whether schools for young children kept by women existed in England before the Reformation is a question that research has not yet answered. It is, however, known that women acted as teachers, and not only in nunnery schools, before the Reformation. In Dan Michel's *Ayenbite of Inwyt*, written in the Kentish Dialect in 1340, Avarice is called " The maystresse thet heth zuo greate scole thet alle guoth thrin vor to lyerni " (Early English Text Society's ed., G. D. R. Morris, p. 34), and this phrase shows that a school conducted by a mistress was not an unfamiliar notion. Mr. A. F. Leach (*Victoria County History*, Lincolnshire, Vol. II, p. 451) quotes an entry in the records of the Corpus Christi Guild at Boston in Lincolnshire for the year 1404 which contains the phrase " Matilda Marefleet, school mistress (*Magistra Scolarum*) in Boston." Mr. Leach considers that the school in question could not have been the Boston grammar school, as the Chancellor of Lincoln, in whose hands the appointment to the grammar school lay, would not have licensed a woman. The school probably was not the Boston grammar school, and was almost certainly what we should call a dame school, but it is clear that the chancellor of the diocese could grant a woman a license to teach grammar. The Petition of 1406 (7 and 8 Hen. IV, *Rot. Parl.*, III, 584. See A. Abram's *Social England in the Fifteenth Century*, p. 182) asked that no man or woman should " exercise ascuns escoles d'ascun secte ou doctrine " contrary to the Established Church. This rather suggests that women might teach in orthodox schools. But it is unwise to dogmatize on the question of medieval Dame Schools. We may go so far as to say that they probably existed, though the fact that girls went to school (see 2 Hen. IV, c. 15, 1401) is no proof that there were school mistresses, for it is known that secular priests taught little girls as well as little boys, as in the case of Sir William Barbour's private elementary school in London (*Early Chancery Proceedings*, 1485). The early evidence for dame schools after the Reformation is even more scarce than for the earlier period, but this is clearly because the subject has not been pursued. In fact, local small schools governed by mistresses were plentiful enough in Elizabethan times. Mulcaster (*q.v.*) seems to make this clear. But the dame school did not become common until the absence of better elementary schools in the early eighteenth century created an opening for these small private adventure schools. Shenstone (1714–1763) described such a village school in the most decadent period of English education in his poem *The School Mistress*. In this poem Shenstone commemorates his first teacher, an ancient dame, Sarah Lloyd:

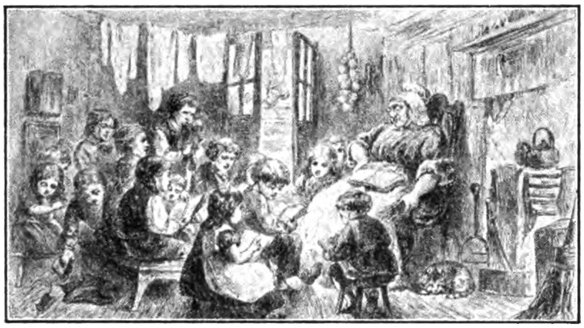
> " In every village mark'd with little spire,
> Embowered in trees, and hardly known to fame,
> There dwells in lowly shed, and mean attire,
> A matron old, whom we schoolmistress name,
> Who boasts unruly brats with birch to tame."

" Learning's little tenement " had a board at the door to prevent the infants from straying. The dame tempers the birch with gingerbread and "sugared cakes," thus rewarding goodness as well as naughtiness. Her method of teaching is shown by the following stanza: —

> " Lo, now with state she utters her command !
> Eftsoons the urchins to these tasks repair,
> Their books of stature small they take in hand
> Which with pellucid horn secured are,
> To save from fingers wet the letters fair."

The education given from this time on for more than a century in these schools was instructionally almost valueless. In Mr. Brougham's speech in the House of Commons on Mar. 28, 1820, on the " Education of the Poor " (see Hansard, Vol. II, cols. 49, 89) he refers to the dame schools, " where 53,000 were educated, or rather not educated, for it amounted to no education at all, since the children were generally sent too young, and taken away just when they were competent to learn. He admitted, notwithstanding that these dame schools were most useful, on account of the regularity and discipline they inculcated. . . . He anticipated that dame schools would get into better hands, and be better conducted. One school of that most interesting class was but a short walk from the spot on which he then stood; and he had already called the attention of the House to it. . . . But if dame schools were better regulated, and adapted to the example of the school in Westminster, and the example of Fellenberg (*q.v.*) and Lanark (see articles on BUCHANAN and ROBERT OWEN), he would not say that there would not be a pauper or criminal in England, but he could say that Scotland or Switzerland would not have fewer than England, even in seaport towns." This tribute to the moral and religious influence of dame schools in 1820 is worthy of notice. It must also be noted that some of the elementary free schools were for the time being dame schools. Thus from 1783 to 1786 the Free School at Welbourn was taught by a woman, Mrs. Robson. How low were the salaries paid to women at this time for teaching work is shown by this instance. She was paid *per annum* during the period 1783–1786 twelve guineas, a guinea a month (see Rogers's *History of Agriculture and Prices*, Vol. VII, Pt. i, pp. 523 (i), 525 (ii). The same work gives other information as to the payment of women teachers: Miss Poe on January, 1776, at Castle Howard was paid for one quarter's schooling, ten shillings and sixpence (*ibid.* p. 517 (iii). There are other cases (in 1755) when teaching was paid at rates varying from one to two shillings a week.

Throughout England the institution existed in practically the same form until very recent times, although its place has now been taken to a large extent by the public infant schools. The description of these schools in the *Report of the Educational Commission*, 1861, gives a detailed picture, many features of which have characterized the dame school throughout its entire existence: " Dames' schools are very common both in the country and in towns. They are frequently little more than nurseries, in which the nurse collects the children of many families into her own house instead of attending upon the children of some one family. The general character of these schools is the same in every part of the country. Women are always the teachers. They are generally advanced in life. . . . The dames' schools are apt to be close, crowded, and dirty. ' The usual scene of these schools,' says Mr. Winder, in reference to Rochdale, ' is a cottage kitchen, in which the mistress divides her time between her pupils and her domestic duties. The children sit round the room, often so thickly stowed as to occupy every available corner, and spend the greater part of their time in knitting and sewing. At intervals the mistress calls them up, one or two at a time, and teaches the alphabet and easy words, the highest proficiency attained being the power of reading a little in the New Testament.' In Plymouth and Devonport the account given of such schools is even less satisfactory. One of Mr. Cumin's informants says: ' The dames most commonly have only one room for every purpose, and their scholars may often be seen sitting round the sides of a four-post bed on low forms, the sides of the bed forming a back to the seat; sometimes on the sides of the bed. When the children are present, the atmosphere is always oppressive to me, and often, if I stay in it for ten minutes without opening the window, it makes me sick.' 'The room,' adds Mr. Cumin, from his own observation, ' is often so small that the children cannot stand in a semicircle round the teacher Indeed, I have seen the children as closely packed as birds in a nest, and tumbling over each other like puppies in a kennel.' " J. E. G. de M.



A London Dame School (1870).

America. — The dame school was transplanted to America at the time of the colonization. But although the dame schools undoubtedly existed in Massachusetts from the earliest settlements, the first definite mention of them is found in Woburn, Mass., in 1673. One was kept by " Allen Convar's wife," another by " Joseph Wright's wife." In Concord in 1680 there were " in every quarter of our town men and women that teach to read and write English when parents can spare their children and others to go to them." In Cambridge " for English our school dame is goodwife Healy." Samuel Sewall records in his Diary in April, 1691: " This afternoon had Joseph to school to Capt. Townsend's mother, his cousin Jane accompanying him; carried his horn book." Mrs. Trivett and Mrs. Wooddell were dames in Boston during the second decade of the eighteenth century. The wife of Ebenezer Field, the smith of the town of Northfield, kept the first school in that town during 1721. " She taught a class of young children at her own house, for twenty weeks of the warm season." Instruction was confined largely to the learning of the A B C's and the beginnings of reading. The hornbook (*q.v.*), so called by reason of its construction, was widely used for this purpose. Those dames who received older pupils taught them from a speller or primer. The reading matter was wholly religious or moral. Instruction in knitting was also sometimes given. It is said that the dames were usually engaged in knitting or sewing during the time they were teaching, and that a rap of the thimble upon the head of a disorderly child was one of the most favored methods of discipline. Household duties of various sorts were also given attention during hours of instruction. The Dame School was the primary school of early New England, the knowledge attained in it being a prerequisite to entrance to the town reading and writing, or grammar school. There were usually several dame schools in each town, situated at central

points of population. The distribution of dame schools played a very large part in the creation of the idea of the moving school (*q.v.*). During the eighteenth century some towns supported public dame schools. The private dame schools continued, however, until the existence of public primary schools became general during the first half of the nineteenth century. The private primary school of the present day is a development and perfection of the dame school.
P. M.

See Abcdarians; Infant Schools; Kindergarten; Middle Ages, Education in; Winkelschulen.

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A Dame School of the Early Nineteenth Century in Salem, Mass., is described in the *Atlantic Monthly* for January, 1885.

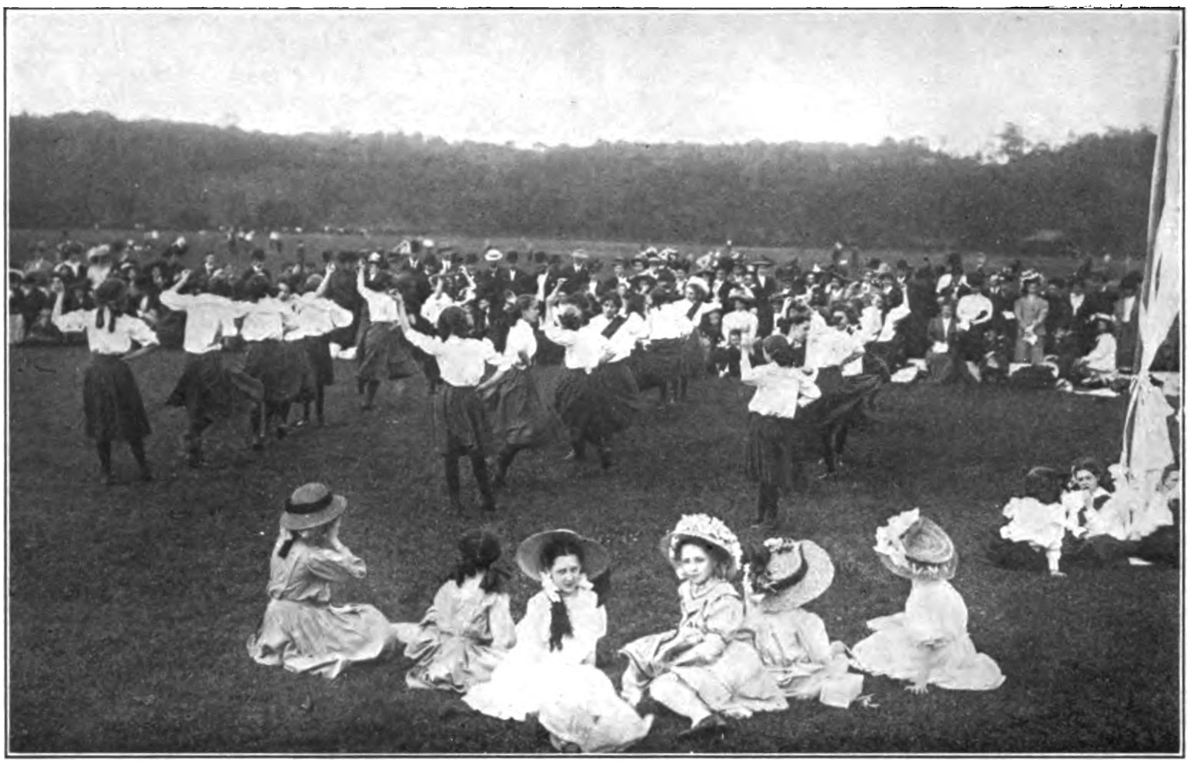
DANA COLLEGE AND TRINITY SEMINARY, BLAIR, NEB. — A coeducational institution owned and supported by the United Danish Evangelical Lutheran Church in America. Danish is used largely in the theological branches as the medium of instruction. Academic, collegiate, normal, commercial, musical, and theological departments are maintained. Only two years of college work are given, and based on about eight points of high school work. There are ten professors and one instructor on the faculty.

DANA, JAMES DWIGHT (1813–1895). — One of the founders of the National Academy of Science and the American Association for the Advancement of Science (*q.v.*) was graduated from Yale College in 1833. He was two years mathematical instructor of midshipmen in the United States navy, and many years professor of physical science in Yale College. Author of textbooks in geology and mineralogy and of many other scientific works. W. S. M.

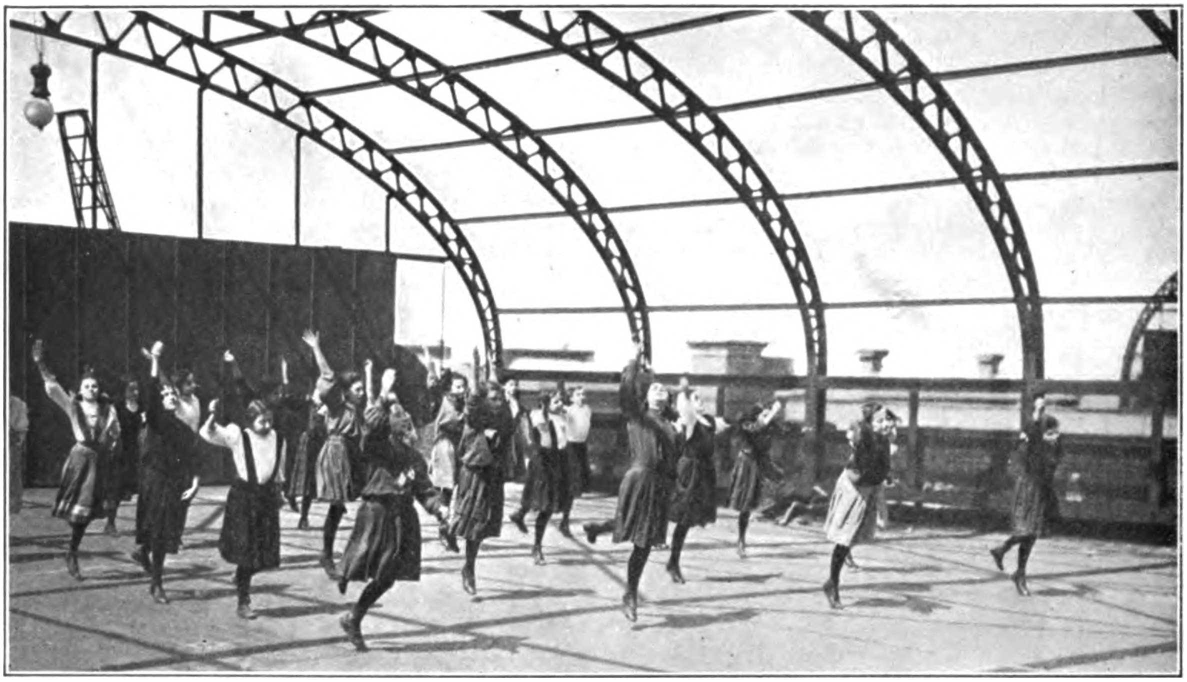
DANCING. — The dance is a form of movement in which the motion itself is the object of interest. It is thus differentiated from all forms of movements which are employed for the accomplishment of some practical aim, as well as from those motions that are employed in play where something has to be done in order to win. It is also different from those motions like yawning, stretching, walking, hopping, and flapping of wings, which are done for the sake of the relief through change which they bring about. The dance compensates for this lack of motive for its movements by two important means: First, through rhythm, a definite form is produced by means of repetition; second, through imitation and association, as well as by dress, speech, and song, a content and meaning are given to the form. While some animals, such as the bower bird, go through movements at the time of mating said to resemble dancing, the rhythmic element is so slightly sustained that it is safe to say that the dance is preeminently a form of movement associated with human intelligence. In fact, as the development of the hand as a means for using tools had a profound influence in developing man's intelligence, so the rhythmical use of the body as a means of formal expression must have a profound influence in developing the soul of man.

It is thus not surprising to find a mature and well-developed art of self-expression through the dance, appearing at the commencement of the history of all peoples, keeping its place, as with the Greeks, after other more highly organized forms of expression have been developed. Still it is not strange that with the development of civilization the importance and significance of the dance should gradually diminish. It would be hard for a modern man to appreciate the feeling of the Indian, who is quoted as saying that he did not think the white man could have a religion because he had no dance. With the development of other forms of artistic expression, and the living under artificial conditions that civilized life requires, the dance has not only lost much of its artistic significance, but it has become debased in many cases and employed for unworthy ends. Among the Turks, for instance, the true believer would consider it a disgrace to take part in a dance, but he has no objection to the hiring of men who make a profession of dressing up like women and dancing. In Christian countries, there is not only a tendency not to recognize dancing as a legitimate form of artistic expression, but to consider it rather a frivolous pastime. That the degenerate and unwholesome forms of dancing that prevail so largely in civilized countries justify this feeling cannot be denied, at the same time there is distinct evidence of a widespread movement in which the attitude towards dancing is undergoing a radical change. The dance is being interpreted through the motives of primitive people, and recognized as a subtle form of artistic expression.

With this change, the employment of the dance as a school activity is rapidly growing. It is being recognized that musical ability and the various forms of plastic art, as well as language, require not only some natural aptitude, but considerable training, before they can become adequate mediums of expression. The child has in his body, like the primitive man, the fully developed means of self-expression, which needs but a slight amount of guidance and rhythmic organization to become an extremely effective means of self-expression. That this new treatment of the dance should present con-



In a New York City Park.



On the Roof of a New York City School.

FOLK DANCING IN THE PUBLIC SCHOOLS.

siderable variety both as to motive and method would be expected. These could be characterized under three main heads, gradually changing into each other. In the first, the emphasis being placed largely on physical skill and precision, intellectual qualities are emphasized. Strength and endurance are developed in the second. The story-telling social side becomes prominent, and the dance presents fairly well-developed imitations of social activities, such as games and occupations. In the third, the bald imitations and ideas are replaced by symbolic movements, and the emphasis is placed on grace of body and movement. Such work as that taught by Jacques Dalcroze of the Conservatory of Geneva, and that which is illustrated by Isadora Duncan, both represent this last type.

In schools, those dances conceived as physical exercises require precision in movement with no characteristic, except that they are done to music. They represent the first type. While not many schools employ folk dances with the introduction of jumping rope and movements with balls, handkerchiefs, and wands, those that do illustrate the second type. The dance represented by the third type is that in which body, mind, and spirit all unite through rhythmically coördinated forms as a means of self-expression. In this broad light, its value toward self, school dancing might be considered the most important of the child's activities. The rapid development of school dancing both on the Continent and in this country bears testimony to the growing importance of the subject.

A recent development of dancing in education is the introduction of folk dances from different countries in the physical training curriculum. The impetus for this new movement came in 1905 from the organization of the Girls' Branch of the Public Schools Athletic League (*q.v.*), of New York City Schools, for the purpose of providing recreative physical activities for the girls in the New York public schools by Dr. L. H. Gulick. The athletic activities previously organized for the boys were not considered suitable for girls, and classes in folk dancing were organized for them. This report on the principles that determine the educational value of the danées is as follows: " A study of the various dances used by the peoples in the different parts of the world quickly revealed the fact that a large number of these dances were not suited to the objects sought by the directors of the Girls' Branch. In some of the dances, for example, but few individuals are dancing at a time, the rest remaining still, thus involving a waste of time. An excellent example of this is the Virginia Reel, known also as Sir Roger de Coverley, a dance interesting in itself, excellent from the social standpoint, but lacking from the standpoint of physical exercise. Therefore, one of the first principles of selection was the picking out of those dances in which most of the individuals are active most of the time. Then again some of the folk dances require for their performance more space than is commonly available in the gymnasium, the school basement, or the schoolyard. Thus space, as well as time considerations, are involved in the selection of each dance. Those dances are chosen which can be done by the largest number in the most limited space.

As far as possible dances have been selected which involve large movements of the body, arms, and limbs. This at once removes from the possibility of use such a large group of dances as that represented predominantly by the dances from Java, in which much of the work and symbolism is done by the forearm and wrist. Another consideration is that the postures involved in the dances shall be graceful and such as do not tend in any way to the forming of habits of movement or posture which are disadvantageous from the standpoint of health. As an illustration of the dances that have been avoided on this score may be cited those Indian dances in which for a considerable portion of the time the body is bent forward, the individual dancing with bent knees and in a crouching position. While it has not been possible to avoid these positions altogether, no dances have been selected in which these postures are predominant. Another most important consideration is that the dances shall be sufficiently simple, so that the children can learn them without an undue amount of training. It has also been found necessary to avoid using a large number of folk dances because of their unsuitability from the emotional standpoint. For example, the love dances of the East, however beneficial they may be from the standpoint of the bodily movements involved, are entirely unsuited from the standpoint of their emotional content and their relation to the morals of our civilization. It will thus be seen that the range of available folk dances meeting these various conditions is comparatively small. While the Girls' Branch teaches folk dancing, it is not by any means an indiscriminate teaching of all the folk dances of all peoples. The work consists only in the teaching of those folk dances which meet physiological, moral, and social conditions.

In considering these various questions, the dangers of dancing, it is believed, have been largely met. It is recognized that there are many people who are not only fearful of dancing, but who see in it genuine evil. That to which these people object is also objected to by those who have the management of the Girls' Branch. The experience of the last four years indicates clearly that the joyous freedom of these dances which are suitable from the various standpoints mentioned tends to minimize rather than to increase the dangers that were anticipated from the start. The attractiveness of the dance hall has been lessened for those who can have in school the beautiful Old World folk dances. Another and entirely different aspect of the case is also important. The parents of the children, as they come to school and see their children taking part in these dances of the various races, have come to feel that there are ties between themselves and their own children and the historic past of their own peoples, which formerly had been lacking. The children, on the other hand, who are doing the dances which their parents before them have done as children and as young people, coming to understand something of the meaning of these dances, have had their ancestral history interpreted to them in a way which it is hardly possible to accomplish by any other means. These dances constitute a real tie between the old and the new.

The conservative treatment that has been given these folk dances has resulted in an almost entire absence of that criticism which is so commonly made against dancing. It was expected when folk dancing was undertaken by the Girls' Branch that there would be a considerable body of conscientious people who would seriously object to it. But when the basis of selection of the dances was seen, and the fact was realized that the dancing was tied up with the school and home life, that the dances were selected with reference to their suitability from the moral and social, as well as the physiological, standpoint, the critics have not merely refrained from criticizing, but they have joined those who were in support of the movement. Dancing, like every other form of art, has its possibilities of danger." (*Healthful Art of Dancing*, pp. 38-44.) The guidance of this movement in its early stages in New York in so markedly successful a way has been due not only to the wisdom of the Board of Directors of the Girls' Branch, but also to the fact that these directors were ladies of such standing in the community as to warrant confidence that what they would advocate would be thoroughly judicious and conservative. That folk dances are attractive to girls is shown by the growth of these voluntary classes; the first year there were 200 girls enrolled, the second year over 3000, the third year over 7000, and this year about 30,000. The number of girls participating was limited by the number of teachers available, for many more girls wanted to join, but could not be accommodated. As a result of the remarkable success achieved by these voluntary classes, instruction in folk dances has been adopted as a part of the physical training work in the high and elementary schools for girls of New York City. The movement is growing rapidly, as evidenced by the introduction of instruction in folk dancing in all the normal schools and summer schools of physical education, in playgrounds, and in many schools; and also by the publication of several books on the subject. Social dancing occupies a very small place in the educational curriculum. It is taught in many schools and colleges for girls because the present social customs require that every girl should possess this accomplishment. Other forms of dancing, such as national dances and pantomime dancing, have a certain educational value, but they have not as yet received much consideration in education.

C. H. F. and G. L. M.

See Drama and Education; Festivals, Schools.

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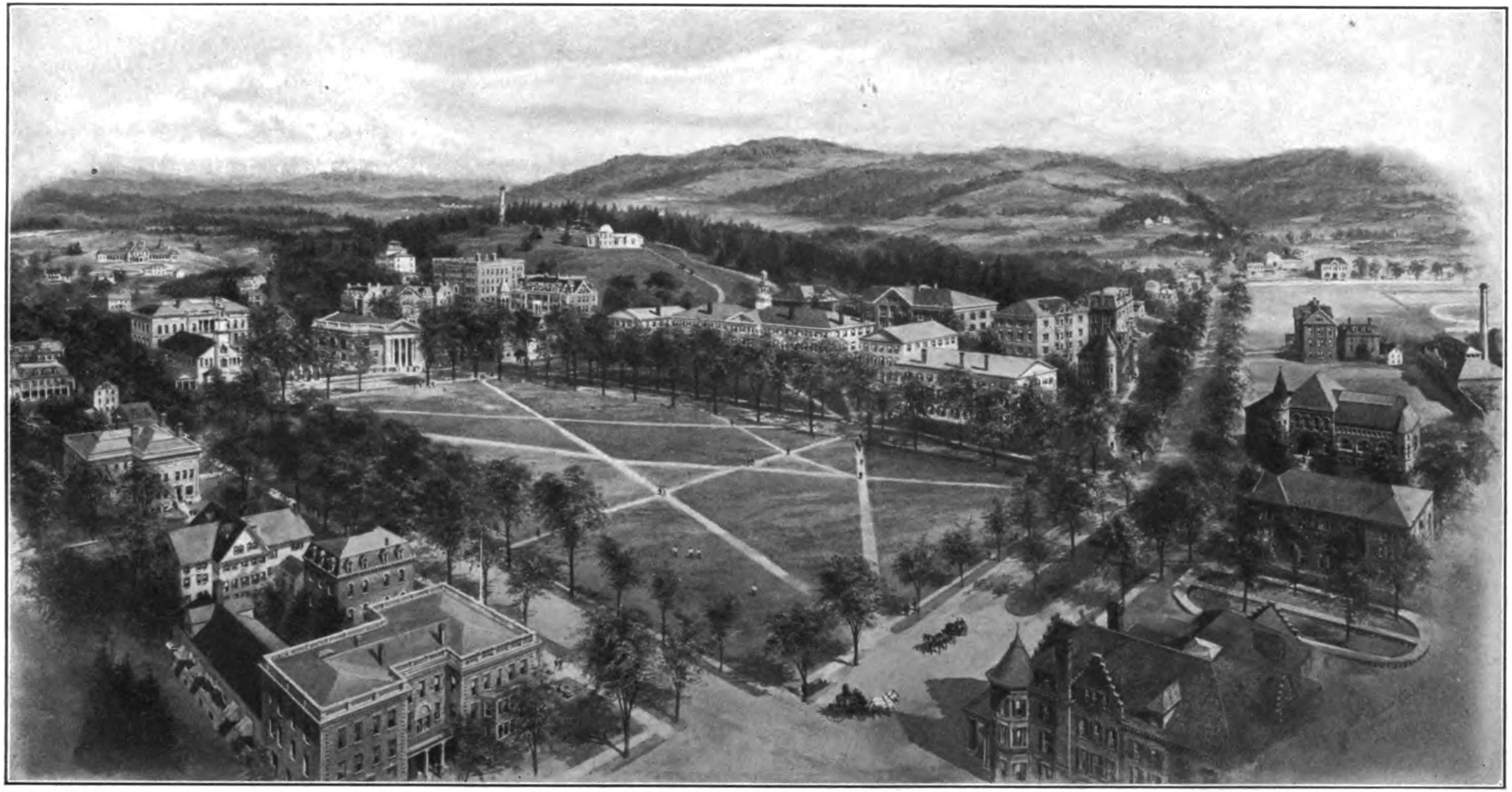
DANTE ALIGHIERI. — Italian poet and scholar, born in Florence in 1265. We have little information in regard to his life; he become involved in the political struggles of his native town, from which he was exiled in 1302 and wandered about Italy " like a ship without sail or helm, driven by the winds that grievous poverty exhales," until death overtook him in Ravenna in 1321. He was thoroughly versed in the philosophy and science of his age and was familiar with the writings of Aristotle and the better known among the ancient Latin authors. Charles Eliot Norton has well said that " Dante was born a student, as he was born a poet, and had he never written a single poem, he would still have been famous as the most profound scholar of his times. Far as he surpassed his contemporaries in poetry, he was no less their superior in the depth and extent of his knowledge." His *Commedia* is a very complete poetic and allegorical exposition of the medieval scholastic *Weltanschauung*, and deserves careful study as such. From the standpoint of education his *Banquet* (*Il Convito* or *Convivio*) is of especial interest. It represents the beginnings of a democratization and popularizing of scientific knowledge, rather alien to the earlier period, which has developed in recent times into our university extension and innumerable other plans for bringing science and literature within the range of those who are cut off from regular academic pursuits. The *Banquet* opens with Aristotle's dictum that " all men by nature de-



DARTMOUTH COLLEGE.

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sire to know"; but, as Dante observes, a great part of mankind is bereft of the advantages of knowledge either by incapacity or by the preoccupations and duties of domestic or political life. To those who might learn if they but had the chance he freely and generously brings such knowledge as he himself has been able to gain, carefully adapting it to their needs. The form he adopts is fantastic — a commentary on fourteen odes, which he had earlier written, which he proposes to explain in their literal, moral, and allegorical senses. He first sets forth a long argument in defense of the use of Italian instead of the Latin, which would have been more natural where a commentary was in question. Latin, he declares, is commonly acquired mainly with a hope of worldly gain; while goodness of mind is to be found chiefly among the "unlettered," that is to say, those who know only their mother tongue. Among these are " princes, barons, and knights, and many other noble folk, not only men but women." The work, which contains many interesting suggestions of Dante's range of knowledge and acquaintance with the Latin writers, was never completed. Only three of the fourteen odes are commented upon, and it may well be that the author was dissatisfied with the spirit and highly artificial character of the enterprise or that he became engrossed in his great poem.

Dante prepared a special treatise on the mother tongue, *De Vulgari Eloquentia,* in Latin, which shows a remarkable understanding of the several Romance tongues with which he was familiar and their relation to the Latin. He laid, in a way, the foundation of modern comparative philology. In his *De Monarchia,* he attempts to establish the normal and rightful unity of human government, as illustrated by the Roman Empire. He had none of the pessimism of Petrarch and the later Humanists, but thought of the world's history as a divine drama upon which the curtain had not yet fallen. Rome was as consecrated as Judea, for when David was born Rome was born: " Whereby the divine election of the Roman Empire is manifest enough; to-wit by the birth of the holy city being at the same time as the root of the family of Mary." In a little treatise, *Aqua et Terra,* commonly attributed to Dante, the author explains certain phenomena due to the sphericity of the earth, and the pamphlet may properly be reckoned with the *Banquet* as a contribution to popular science. Dante was still completely under the dominion of Aristotle; the Philosopher's words are " the supreme and most lofty authority " ; he is " the master and artificer that has explained the goal of human life"; "the master and leader of human reason." Edward Moore has collected and tabulated all of Dante's references to classical authors, and it is clear that he was familiar with practically the whole range of Aristotle's encyclopedic writings in the Latin versions then available. J. H. R.

References: —

A bibliography of the literature relating to Dante would be well nigh interminable. Suffice it to say here that the Clarendon Press, Oxford, has published an admirable edition of his complete Italian and Latin works, edited by Edward Moore, whose *Studies in Dante* (First Series, 1897) is very useful. The best translation of the *Convivio* is that of Wicksteed, in The Temple Classics, with admirable notes. Charles Eliot Norton has given us a prose translation, with a few notes, of the *Commedia* and of the *Vita Nuova;* F. J. Church has translated the *De Monarchia* (1879), and A. J. F. Howell the *De Vulgari Eloquentia* (1900).

DARBY, JOHN (1804–1877). — An author of textbooks in science ; was graduated from Williams College in 1831 ; and was for many years instructor of science in secondary schools and collegiate institutions in the South. He was for a time professor in Williams College, later in the Eastern Alabama College, and from 1869 to 1875 president of Kentucky Wesleyan College. His textbooks on botany and chemistry were widely used. W. S. M.

DARK AGES, THE. — See MIDDLE AGES, EDUCATION IN.

DARK-AND-LIGHT WORK.— The structural elements in the space arts are Line, Dark-and-Light, and Color. The term " Dark-and-Light work " is applied to exercises in tone and values ; to a study of fine relations of tone. In a progressive system of structural art study, one would begin with composition in two values; following with three values, and finally with many values, or work in full tone.

See ART IN THE SCHOOLS ; ART, METHODS OF TEACHING ; DESIGN, etc.

DARTMOUTH COLLEGE, HANOVER, N. H. — The outgrowth of Moor's Indian Charity School, opened by Rev. Eleazer Wheelock at Lebanon, Conn., in 1754. A sum of £10,000 was collected in Great Britain and placed in trust. With the endowment Dr. Wheelock decided to extend the sphere of his work and to admit English students. The institution was moved to Hanover in 1785, a choice determined by the location of the town as a center and the probability of securing a charter. In the charter the name of Dartmouth College was adopted as a compliment to Lord Dartmouth, who was head of the Board of Trustees in England and took a great interest in the institution. Dr. Wheelock was the first president, with Mr. Bezaleel Woodward as his associate. As the work of educating Indians gradually disappeared from the program, Moor's Indian Charity School became a separate institution when the college was founded, and was maintained up to 1849. The support which came from England was withdrawn. A further difficulty was the struggle between the trustees of the college and the state for the control of the institution, decided in 1819 by the Supreme Court of the United States in favor of the trustees. (See

Dartmouth College Case.) In 1798 a medical school was established and is under the general control of the trustees of the college which grants the degrees. In 1857 the Chander School of Science and Arts was established, and in 1893 became an intimate part of the college as the Chander Scientific Course. (See Technical Education.) The Thayer School of Engineering was established in 1867, and while its funds are in charge of the trustees of the college, its general affairs are managed by a close corporation of overseers. The trustees also manage the Amos Tuck School of Administration and Finance, established in 1900 to provide courses in commercial education (*q.v.*).

Candidates for admission to the college must secure credit for fourteen and a half units; of these four units are elective in the case of candidates for the A.B. degree, and five units in the case of candidates for the B.S. degree. The examination of the College Entrance Examination Board is accepted, as well as certificates from preparatory schools which have been approved by the college. For entrance to the Dartmouth Medical School candidates must have completed two years of college work. The Thayer School offers a two-year course in engineering, which may be entered upon in the senior year, thus making a five-year course in all. The requirements in the Amos Tuck School are similar. The enrollment for 1910–1911 was 1229, including 1165 students in the college; 41 in the medical school; 43 in the Thayer School; 34 in the Tuck School. The faculty of the college alone consists of twenty-four professors, twenty-four assistant professors, and twenty-three instructors. Ernest Fox Nichols, D.Sc., LL.D., is the president.

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DARTMOUTH COLLEGE CASE. — A *cause célèbre* in United States constitutional law, affecting not only college administration, but also industrial and commercial corporations. Dartmouth College (*q.v.*) had received a charter from the British governor in 1769, and held considerable property, to which additions were made both by the state of New Hampshire and the state of Vermont. The executive functions were exercised by a Board of Trustees which was self-perpetuating. In 1816 the Governor of New Hampshire invited the legislature to amend the charter of the college on the grounds that the state had made contributions to its funds, that the college was the leading learned institution of the state, that the existing charter contained principles congenial to monarchy in the constitution of the Board of Trustees, and that a reform in accordance with the spirit and genius of free government should be made. Accordingly a law was passed by which the Governor and Council were empowered to appoint a Board of Overseers, and the Governor to appoint eleven additional trustees. The title of the institution was to be changed to University. The old trustees were not consulted in the matter, and refused to accept the amending law, although in principle they were not opposed to closer connection with the state. Accordingly for a time the two bodies, the university and the college, stood side by side. The college trustees, however, brought an action against the officers of the new board for the recovery of property which had been seized. The case was carried to the supreme court of New Hampshire, which decided against the college. It was determined to carry the matter to the Supreme Court of the United States, and it was tried before the full court of seven justices. Apart from its legal importance the case is notable for the arguments of Daniel Webster on behalf of the plaintiffs. The decision of the court was issued in 1819 with the agreement of all the justices but one. The acts of the New Hampshire legislature were declared unconstitutional and void; the college was held to be a private and not a public corporation, that had been created by a charter granted to the trustees and their successors. The decision was based on the constitutional declaration that "no state shall pass any . . . law impairing the obligation of contracts." This case gave security to all classes of chartered institutions against state interference. The founder in this instance had aimed to secure the freedom of the college from local interference and control, and this purpose was upheld legally. The rights of private and corporate property were safeguarded.

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DARWIN, CHARLES.—Born at Shrewsbury on Feb. 12, 1809, and died at Down on Apr. 19, 1882. His father was Robert Waring Darwin, a successful physician (1776–1848); his grandfather was Erasmus Darwin, with whom he had many mental traits in common. His early school days (1818–1825) were spent at Dr. Butler's school at Shrewsbury. Even at this early age his taste for natural history and collection showed itself. His work in this school, being chiefly classical, was distasteful to him, and in October, 1825, his father removed him and sent him to Edinburgh University to begin the study of medicine. The work at Edinburgh was not enjoyed by Darwin. He became fast friends, however, with older university men, who encouraged him in the study of geology and zoölogy. While there, he prepared and read one or two zoölogical papers before the Plinian Society. After spending two years at Edinburgh, it became evident to Darwin that the life of a physician would be distasteful to him, and his father proposed that he should become a clergyman. He went to Cambridge in 1828 to begin work upon his B.A. degree, and passed his examinations for it in 1831. During his stay at Cambridge, as at Edinburgh, he got most enjoyment from his naturalist work (especially in the collection of beetles), and in hunting and fishing. He himself says that his time was sadly wasted in both institutions. His five-year trip with Captain Fitz-Roy as naturalist on board the *Beagle* (1831–1836) gave the first pronounced impetus toward a scientific career, and furnished him with an enormous amount of zoölogical and geological material. Even before his return from this trip, he was well embarked upon his scientific career. In 1839 Darwin married his cousin, Emma Wedgwood, and in 1842 he settled at Down, at which place most of his writing and scientific labors were done. A large part of his time was spent in publishing the results, geological and biological, of his trip in the *Beagle.* In 1846 he began his laborious work upon the Cirripedia, which occupied him eight years. Even as far back as 1838 (the date of his reading Malthus on *Population*), however, his mind had begun to work upon the problems connected with descent. From that time until the appearance of the *Origin of Species* in 1859, his mind was never wholly free from these problems. Notwithstanding the ill health which clouded his whole adult life, Darwin was a prolific writer, and published upon a wide series of topics. His best known works are, *A Naturalist's Voyage Around the World, The Structure and Distribution of Coral Reefs, The Origin of Species by Means of Natural Selection, The Descent of Man, Emotional Expressions of Man and the Lower Animals.*

In common with Erasmus Darwin and with Lamarck (*q.v.*), Charles Darwin believed in descent; that is, that the complex species have descended from less complex species. He, however, was the first biologist to advance a clear and logical hypothesis of the mechanism of descent, which was at the same time supported by an enormous mass of observed biological data. His observations in systematic zoölogy gave him the starting point for his theory. When the individual members of any given species are examined, they show numerous indefinite slight peculiarities which cannot be accounted for by inheritance from either parent, nor from any remote ancestor. That these slight peculiarities were heritable was supposed by Darwin to be a fact of everyday observation. A second point in his theory is given when we consider the fact that organisms, regardless of the mode of the reproductive process, multiply in a geometric ratio. This leads logically to the conclusion that in a short time food and actual standing room would soon be impossible to obtain, unless some checking process occurred (the doctrine of Malthus). Actual observation, however, shows that the number of any given species remains approximately the same in any given locality. Consequently a checking process occurs which takes the form of a more or less pronounced struggle both among the different species and among different individuals of the same species. In this struggle, in which only the fittest survive, the possession by any member of a species (or by the species as a whole) of slight variations which put their possessor at even a slight advantage over his adversaries, will on the average and in the long run lead to the survival of that individual (or species). And since only those organisms which possess these favorable variations survive, it is obvious that their progeny will likewise possess them, and thus a definite step in differentiation occurs. In such a manner does Darwin suppose that the various adaptive structures arise. These structures may be slight, but they are first steps toward "slight varieties"; these in turn become differentiated into more strongly marked and permanent varieties, the process culminating finally in sub-species and in true species.

The process just described is the main prop of the selection theory. Two other auxiliary theories are urged by Darwin in support of it: the sexual selection theory, and the "use and disuse" hypothesis of Lamarck. The notion of sexual selection was also forced upon Darwin by the apparent logic of systematic observation. Many of the characters possessed by the individuals of any species (so-called secondary sexual characters) are of no use in any actual struggle for food, shelter, possession of the female, etc., and hence their survival value is to be sought for elsewhere. Such secondary sexual characters may be illustrated in birds by the differences in their coloration, in the size, shape, and arrangement of their plumage, in certain of their appendages, and in the musical character of their notes; and in other animals by differences in odor, etc. In order to account for the origin of these characters, Darwin supposed that their possession aided in the selection of a mate; the mate (especially true of the female's choice of the male) would be chosen by reason of its greater attractiveness. Many other factors are considered by Darwin in his species theory, such as the effect of differences in climatic conditions, isolation, the bearings of geographical distribution, the occurrence of "sports," the theory of pangenesis, etc.; but the above summary statements give the gist of a theory which would account in a nonteleological way for the gradual transition from amœba to man.

The influence of Darwinism upon the various separate sciences and arts has been of so complex and intimate a character that a full discussion of it alone requires encyclopedic treatment. It suffices here to point out briefly the bearing of this great biological movement upon psychology and education. The genetic treatment of psychological and educational problems may well find its origin in the gradual permeation of Darwinism into psychology. Darwin furnished a new method of treating mental problems, namely that of studying their growth both phylogenetically and ontogenetically. Before the advent of this movement, emotion, instinct, and impulses, indeed, all of the psychological processes, were merely grouped and classified. This statistical and classificatory treatment of psychological processes has many points of similarity with the Linnean method in biology. After the advent of Darwinism, instincts and impulses, perception and imagination, were looked upon as weapons of adaptation, as having definite survival value, and as putting their possessor at an advantage in the struggle for existence. (See article on INSTINCT.) They were looked upon as growth processes which might be studied in the incipient as well as in the more advanced stages. Indeed, it then became evident that the advanced stages — the complex psychological processes — could not be thoroughly understood without carefully studying their origin and growth. Darwin's influence in this realm is most clearly traceable in the two branches of psychological inquiry known as child psychology and animal psychology. It may safely be said that a Darwin was the necessary forerunner of these two branches of study. They depend peculiarly upon the view that makes consciousness not a fixed set of entities, but a developmental process which is clearly traceable both in phylogeny and in ontogeny. In the main this viewpoint is best expressed in *The Descent of Man* and in his *Expressions of the Emotions.* The thesis which he there maintains is that animals are endowed with mind, and that the mental life of animals becomes more complex as we ascend the scale of animal life. Darwin's work in this field was continued by Romanes, Lindsay, Lubbock, Father Wasmann, and many others. Their work, lacking the painstaking and critical spirit of Darwin, descends often into a more or less servile eulogy of the animal mind. Lloyd Morgan in the late eighties broke away from this traditional method of eulogy, and reëxamined the mental life of animals from an experimental standpoint. Thorndike in America continued Morgan's work, and helped largely to lay the foundations for the now well established branch of inquiry which is known as " animal behavior " or " animal psychology." This subject, at least that branch of it which deals with the activities of the higher animals, originated very distinctly with the Darwinian movement.

These phylogenetic studies in mind are paralleled by equally extended ontogenetic researches — as is shown in the widespread psychological and educational movements which are found crystallized in the various writings on child psychology, child study, mental development, and studies in adolescence. The principal names associated with this movement are those of Preyer, Perez, and Stern in Germany, and Baldwin, Stanley Hall, Major, and Miss Shinn in this country. These investigators have materially increased our knowledge both by the accumulation of facts and by the introduction of experimental methods. J. B. W.

See ACQUIRED CHARACTERISTICS; EVOLUTION; FUNCTIONAL PSYCHOLOGY; INSTINCT; PHILOSOPHY OF EDUCATION; PSYCHOLOGY; SELECTION.

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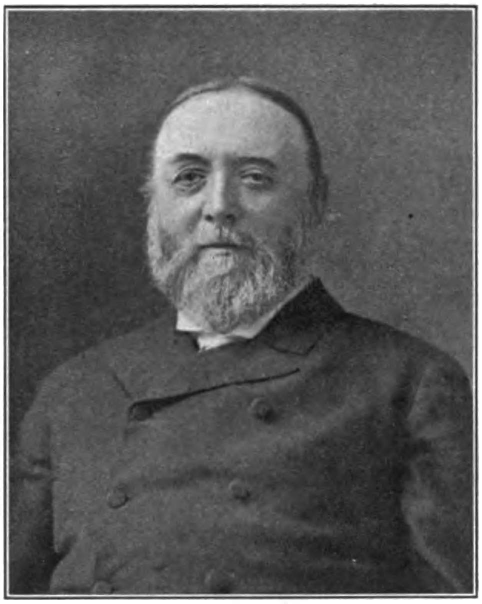
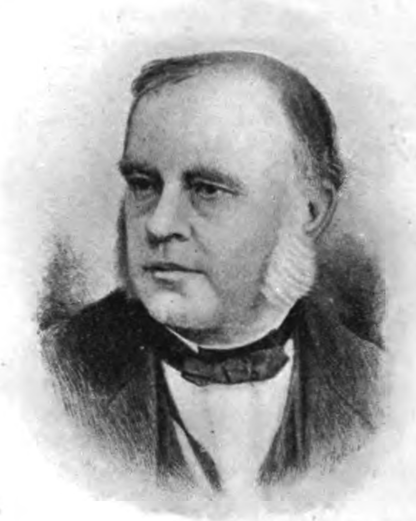
DAUNOU, JEAN CLAUDE FRANÇOIS (1761–1840). — Scholar, historian, statesman. Teacher in the colleges of the Oratory before the Revolution, author of an education bill in 1789, active participant in the debates on public instruction before the Convention, in the Council of the Five Hundred, and in the Chamber of Deputies during the July Monarchy. His *Essai sur l'instruction publique* (1793) was completed by his *Projet analytique d'un loi sur l'instruction publique*, one of the paper schemes of the Convention for extending public education, which prepared the way for the more mature plan of Lepelletier. Daunou was subsequently professor of history at the Collège de France (1819–1831), giving there a course in history, later appearing in twenty volumes (1842–1849). Also author of *Plan d'éducation présenté à l'Assemblée nationale au nom des instituteurs publics de l'Oratoire* (1790).

DAVIDSON COLLEGE, DAVIDSON, N.C. — Founded in 1837, and conducted under the auspices of the Presbyterians of North and South Carolina, Georgia, and Florida. Classical, scientific, postgraduate, and nonresidential courses are offered. Admission to courses leading to degrees is by an examination requiring fourteen units of high school work. Certificates from teachers are accepted in lieu of the entrance examination. There is a faculty of twenty-four members.

DAVIDSON, ROBERT (1750–1812). — Educator; graduated from the University of Pennsylvania in 1771. He was instructor in that institution from 1771 to 1775, and professor from 1780 to 1784. For the next twenty years he was professor in Dickinson College, and from 1804 to 1809 president of Dickinson. He was the author of *Epitome of Geography in Verse*, published in the same year as Morse's first textbook (1784), and of several works on religious education. W. S. M.

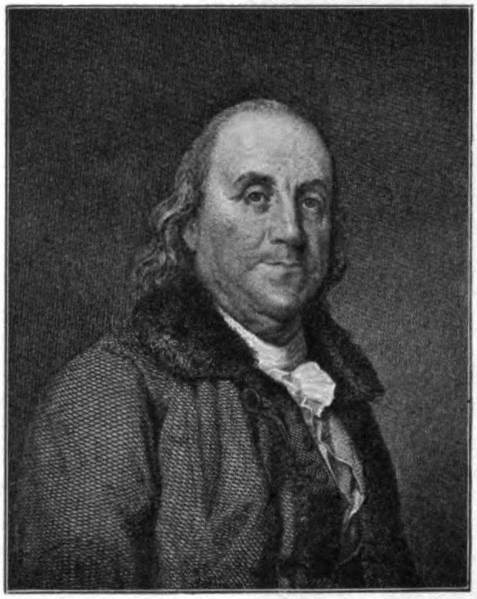


Thomas Davidson (1840-1900).
See p. 255.



John W. Draper (1811-1882).
See p. 366.

John Fiske (1842-1901).
See p. 617.



Benjamin Franklin (1706-1790).
See p. 686.

A Group of American Educators.

DAVIDSON, THOMAS. — Born Oct. 25, 1840, near Fetterangus, Aberdeenshire, Scotland, of very humble antecedents. He was prepared for college by Robert Wilson, the parish schoolmaster of Old Deer, and was graduated from King's College in 1860, after having won the highest honors in Greek, the Simpson Prize. He was rector of the Old Aberdeen grammar school from 1860 to 1863, and then went to England, where he served as classical master, first at Tunbridge Wells and then at a military school in Wimbledon. In 1866 he came to America, and after teaching for a year in the Collegiate Institute of London, Ont., was appointed to a position in the public schools of St. Louis, where he soon rose to be principal of the Branch High School. His intimate friendship with Dr. William T. Harris and other members of the group of thinkers whose organ was *The Journal of Speculative Philosophy* exerted a lasting influence on all of Davidson's subsequent thinking, especially in the philosophical interpretation of art and literature and their function in education. Besides his contributions to this journal, Davidson also wrote for the *Radical* (Boston), the *Round Table* (New York), and the *Western Educational Review* (St. Louis). Of the last mentioned he was also for a time chief editor.

In 1875 Davidson removed to Cambridge and began a career as a private tutor in a number of distinguished Boston families. This enabled him to travel extensively, and from 1877 to 1884 he spent most of his time in Greece and Italy. His extensive walking tours throughout Greece and his association with Dr. Schlieman, who was then conducting his excavations, gave Davidson a vast and intimate knowledge of the conditions of ancient Hellenic culture. (See his *Parthenon Frieze and other Essays*, London, 1882.) In Italy he was attracted by the philosophy of Rosmini (*q.v.*), and lived a good deal with the members of the Rosminian Order. Rosmini's educational theories and the pedagogic practices of his Order influenced Davidson profoundly. He translated and edited Rosmini's *Philosophical System* (London, 1882), and also translated the latter's *Psychology* (3 vols., London, 1883). While in London in 1882, he founded the Fellowship of the New Life, from which the Fabian Society was an offshoot. He also helped in the organization of the Aristotelian Society of London, of which he continued to be corresponding member to the end of his life. On his return to America in 1884 he lectured before the Concord Summer School of Philosophy (*q.v.*) and then tried to establish similar schools of his own in St. Cloud, N. J., and at Farmington, Conn. In 1889 he bought a farm near Keene, N.Y., and established on it the Glenmore Summer School for the Culture Sciences, which has been continued. In 1898 Davidson became associated with the People's Institute and the Educational Alliance of New York, and conceived the idea of establishing a Breadwinner's College, modeled on the London Polytechnic Institute, and the popular universities that were then springing up in France. His death (Sept. 14, 1900) prevented the elaboration of his plan. His work, however, has been continued by his pupils, and an account of the aim and character of this movement can be found in his posthumously published *Education of the Wage Earners* (Boston, 1904).

Davidson's interests in education were predominantly philosophical and social rather than pedagogic. He believed that an inspiring outlook on the great world drama was of greater importance to the teacher than a knowledge of empirical psychology. Education meant to him the whole process of evolution so far as it can be put under conscious control, and he insisted that no reasonable system of education could be established without a rational system of philosophy back of it. His own philosophy, however, underwent a number of tempestuous changes as reflected in his life as a wandering scholar. Moreover, his interests were too wide and his sympathies too passionate and mobile to allow him to express himself with studied consistency. In the main, however, he was an idealist with a tendency to ethical rigorism.

During the period of Rosminian influence, — to which belong his *Prolegomena to Tennyson's In Memoriam* (Boston, 1889), *Aristotle and Ancient Educational Ideals* (New York, 1892), as well as the *Education of the Greek People* (New York, 1894), — he held to a doctrine of a "supernatural sense" or "faith as a faculty," which gives us an immediate experience of a spiritual or divine order. In his later views (1895–1900), however, he became a thorough gnostic, believing that all the truths necessary for a theory of life and education — of which freedom and immortality were the most important — could be demonstrated with apodeictic necessity. The system which he thus developed and which underlies his *Rousseau and Education according to Nature* (New York, 1898), and his *History of Education* (New York, 1900), as well as the important article on Education as World-Building in the *Educational Review*, November, 1900, is a form of epistemologic or subjective idealism of a pluralistic kind, which he himself called apeirotheism. According to that view there is no existence except that of a group of "desiderant feelings," *i.e.* free and eternal souls, whose interaction produces the entire universe.

Davidson's position as a free lance made him a very stern critic of our present educational system. His own constructive program is found in the concluding chapter of his *History of Education*, and in Chapter III of his *Education of the Wage Earners.* (For portrait, see opp. page.) M. R. C.

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DAVIES, CHARLES (1798–1861). — The author of a well known and widely used series of textbooks on mathematics; was born at Washington, Conn., on the 22d of January, 1798. He was graduated from the United States Military Academy at West Point in 1815. For twenty-one years he was in charge of the department of mathematics in that institution, and during this period he prepared his textbooks. Because of impaired health he resigned his position in 1837 and spent the next two years in study and travel. Upon his return he was two years professor of mathematics in Trinity College and two years at the Albany Normal School. He was professor of higher mathematics in Columbia University from 1857 to 1865. His textbooks cover the entire field of mathematics and include a *Cyclopædia of Mathematical Science* (1855) and an account of *The Metric System* (1870). He died at Fishkill, N.Y., in 1876. W. S. M.

DAVIES, SAMUEL (1724–1761). — Educator, who succeeded Jonathan Edwards as the fourth president of Princeton, then the College of New Jersey; was self-educated. For several years he was engaged in religious and educational work in Virginia, and in 1753 he was sent to Great Britain by the trustees of the College of New Jersey to solicit funds. He was elected president of the college in 1759, and served until his death, two years later. W. S. M.

DAVIS, EMERSON (1796–1866). — Educator; born at Ware, Mass., on July 15, 1798, and was graduated from Williams College in 1821. He was for a time tutor in Williams College; principal of the Westfield Academy from 1822 to 1836; principal of the State Normal School at Westfield from 1844 to 1846, and member of the State Board of Education in Massachusetts from 1837 to 1847. Author of *Franklin Intellectual Arithmetic* (1833) and *The Teacher Taught* (1839). He died at Westfield, Mass., in June, 1866. W. S. M.

DAVIS, HENRY (1771–1852). — The second president of Hamilton College; was graduated at Yale in 1796. He was for seven years a tutor of the ancient languages at Williams and Yale Colleges; professor of Greek in Union College from 1806 to 1809; president of Middlebury College from 1809 to 1817, and of Hamilton College from 1817 to 1833. He was active in the American Lyceum Association (*q.v.*) and its first president. W. S. M.

DAWSON, WILLIAM (1704–1752). — The second president of William and Mary College; was born in England and graduated at Queen's College, Oxford, in 1725. He was a professor in William and Mary from 1729 to 1743, and president of the college from 1743 to 1752. His brother, Thomas Dawson (1707–1761), who had made several efforts to organize schools for Indian children in Virginia, was president of William and Mary from 1755 to 1761. W. S. M.

DAY, HENRY NOBLE (1808–1890). — The author of sixteen textbooks and several works on education; was graduated from Yale College in 1828. He was for several years a tutor in the college, and then studied in Europe. For eighteen years (1840–1858) he was professor in the Western Reserve College, and for six years (1858–1864) president of the Ohio Female College. His textbooks include works on elocution, bookkeeping, rhetoric, logic, psychology, and ethics, and his professional works *The Science of Education* (1889). W. S. M.

DAY INDUSTRIAL SCHOOLS. — See Industrial Schools, Day.

DAY, JEREMIAH (1773–1867). — President of Yale College for thirty years; was graduated from that institution in 1795. He was several years principal of the Greenfield High School, and later instructor in Williams and Yale. From 1801 to 1817 he was professor of natural philosophy at Yale, and from 1817 to 1846 president of the college. Author of *Algebra* (1814), *Trigonometry* (1815), and of works on the freedom of the will and science. W. S. M.

DAY, THOMAS (1748–1800). — Author; educated at Charterhouse and Oxford; called to the bar in 1775, but never practiced law. He, like his great friend, R. L. Edgeworth, the father of the authoress, was early attracted by the doctrines of Rousseau and became an ardent adherent of the demand for simplicity and the return to nature. Inspired by humanitarian feelings and the belief that environment was stronger than heredity, a position somewhat inconsistent with his other views, he adopted two young girls, one from a foundling hospital and the other from an orphan asylum. His purpose was to bring them both up and to marry one eventually. The experiment was not successful. Day is best known as the author of *Sandford and Merton*, a book which has for more than a century been a favorite with English boys. This delightful book was written in a missionary spirit, to portray the author's conception of perfect manliness and to inculcate the virtues of independence, courage, and humanity.

See LITERATURE, CHILDREN'S.

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DEAF, EDUCATION OF THE. — Historical Development. — While it is doubtless true that the number of deaf persons in the world has always borne about the same proportion to that of the hearing, it is only within the past few centuries that anything has been done toward their education or the amelioration of their condition. Passing over the few references that occur in the Scriptures and early Greek writers, the well known couplet of Lucretius may be quoted, —

> "To instruct the deaf no art could ever reach,
> No care improve them, and no wisdom teach,"

as indicating the estimation in which they were held in the ancient world.

Perhaps the earliest reference to the education of a deaf person is found in the writings of the Venerable Bede (*q.v.*), who tells how St. John of Beverly taught a young deaf man to speak and read the lips. It was, however, looked upon more as a miracle than education. A number of other cases are also mentioned by some later writers, but much doubt is expressed because of the seeming impossibility of the feat. It was not until the sixteenth century that Jerome Cardan (*q.v.*) (1501–1576) of Pavia, an eccentric genius and speculative philosopher, with probably no actual knowledge of the deaf, wrote: "Writing is associated with speech, and speech with thought, but written characters and ideas may be connected without the intervention of sounds"; and from this he drew the conclusion that "the instruction of the deaf is difficult, but it is possible." Cardan also suggested the possibility of teaching the blind to read by the sense of touch. The first recorded teacher of the deaf is Pedro Ponce de Leon (1520?–1584), a Spanish monk of the Order of St. Benedict. In a legal document written in 1578 he says, "I have had for my pupils, who were deaf and dumb from birth, sons of great lords and notable people, whom I have taught to speak, read, write, and reckon." He also taught Latin, Greek, and Italian, and one of his pupils "was ordained, and held office and emolument in the Church and performed the service of the Canonic Hours." If Ponce de Leon left any written account of his method, it has not come down to us, but we have reason to believe that he began by teaching the written word first, following it with the spoken form.

The first work on the education of the deaf that we have is from the hand of Juan Pablo Bonet (d. 1629?), also a Spaniard, whose method was similar to that of de Leon, for he first taught his pupils to write the letters, and then gave them their phonetic values. In his book he says, "The scholar is dumb because he is deaf, and cannot by any means have his hearing restored. But by sight he can acquire the knowledge lost by deafness." In teaching speech he "exercised the scholar in placing his tongue, teeth, and lips in the positions suitable to the articulation of each letter; then he made them exhale the air necessary for the production of voice." Bonet also states that "the language of action is a natural language," and made use of signs as well as a manual alphabet. Among the British writers on the subject were John Bulwer (fl. 1654), a purely philosophical writer, and William Holder (1616–1698), John Wallis (1616–1703), and George Dalgarno (1626?–1687), all successful teachers of speech to the deaf, who left descriptions of their methods. John Conrad Amman (1669–1724), a native of Switzerland, resident in Haarlem, Holland, was another successful oral teacher, and his writings did much to influence the methods that were adopted not long after in Germany. The first teacher in France was Jacob Rodrigues Periere (1715–1780), a Spaniard, who settled at Bordeaux in 1741.

Up to the middle of the eighteenth century all the instruction had been of a private nature and individual. The method employed was oral supplemented by writing and in some cases by a manual alphabet. With the establishment at Paris in 1760 of a school for poor deaf-mutes by Charles-Michel de l'Épée (1712–1789) a new era in the education of the deaf began, and a new method was introduced. In the same year that the Abbé de l'Épée opened his school in Paris, Thomas Braidwood (1715–1806) began a work at Edinburgh that led to the establishment of schools in Great Britain. A few years later (1778) Samuel Heinicke (1729–1790) opened at Leipzig, under the patronage of the Elector Frederick Augustus of Saxony, the first school in Germany and the first in the world to receive government recognition. The Paris school was taken over by the government as the National Institution in 1791. But in Great Britain the instruction of the deaf remained a monopoly of the Braidwood family for fifty-nine years. All three of these schools were at their foundation oral. It was only the necessity of instructing sixty or more pupils with almost no assistance that caused de l'Épée to devise his system of signs as a more rapid means of teaching. It was with evident regret that he abandoned the oral method, for in 1776 he wrote: "Never will the world train its fingers and eyes to have the pleasure of conversing with the deaf and dumb. The only serious means of giving them back to society is to teach them how to hear with their eyes and speak with their tongues." The Braidwood school became known in America, and, among others, Francis Green of Boston sent his son across to be educated. In 1783 Green wrote his *Vox Oculis Subjecta: A dissertation on the* *most curious and important art of imparting speech, and the knowledge of language, to the naturally deaf, and (consequently) dumb; with a particular account of the Academy of Messrs. Braidwood, of Edinburgh."* In 1812 John Braidwood, a grandson of Thomas, came to America and attempted to establish a school at Cobbs in Virginia, but met with failure because of his personal habits.

The first real work in America began in the winter of 1814–1815, when Thomas Hopkins Gallaudet (1787–1851) of Hartford, Conn., became interested in Alice Cogswell, the deaf and dumb child of a neighbor. This led to the sending of Mr. Gallaudet to Europe to learn the art of teaching the deaf, and naturally he went to England. At both London and Edinburgh he encountered the Braidwood monopoly, and was refused the instruction he sought except upon terms that he was obliged to decline. Returning from Edinburgh to London, he accepted the invitation of the Abbé Sicard, (1742–1822), de l'Épée's successor, who was spending " the hundred days " in England, to go with him to Paris and study his methods. Coming back to America in 1816, Gallaudet opened the school at Hartford in April, 1817, with twenty pupils. Laurent Clerc (1785–1869), one of Sicard's best pupils, accompanied Gallaudet to America, and did much for the education of the deaf both at Hartford and elsewhere. Of course, as the training of Gallaudet and Clerc had been in the French or sign method, that was the method introduced into the United States, and by teachers trained at Hartford it was carried to the schools that were soon established in the other states, as New York in 1818, Pennsylvania in 1822, Kentucky in 1823, Ohio in 1827, and so on, until to-day every state, with the exception of New Hampshire, Vermont, Delaware, Wyoming, and Nevada, has one or more schools. In 1857 the Columbia Institution at Washington was incorporated, and in 1864 the National Deaf-Mute College, the only institution for the higher education of the deaf in the world, was opened with Dr. Edward Miner Gallaudet, the youngest son of Thomas Hopkins Gallaudet, as its president. The name was afterwards changed to Gallaudet College (*q.v.*) in honor of America's pioneer teacher. Meanwhile the followers of Heinicke in Germany had developed a pure oral method, excluding all signs and manual spelling. Horace Mann (1796–1859), the Secretary of the Massachusetts State Board of Education, made a tour of Europe in 1843, and reported on what seemed to him the superiority of the German method. This report called forth much criticism from the sign teachers of America, and not a few went abroad to see for themselves; but as they did not agree in their conclusions with Mann, little change resulted.

There was considerable agitation in Massachusetts, the leaders being Dr. Samuel Gridley Howe (1801–1876) and Gardiner Greene Hubbard (the father of a deaf child). In 1867 John Clarke offered to endow a school for the deaf in that state, and the Clarke Institution (now the Clarke School) was opened under the charge of Miss Harriet B. Rogers, who for two years had had a private school at Chelmsford, near Boston. Miss Rogers had begun her work with the deaf about five years before. The method of the Clarke School has always been oral. In the same year, 1867, an oral school under Jewish auspices was opened in New York City by Bernhard Engelsmann. This was the beginning of the present New York Institution for the Improved Instruction of Deaf Mutes. Two years later a day school for the deaf was opened in Boston and named in honor of Horace Mann. Of course the method was oral. With the establishment of these schools a bitter controversy arose. It was claimed that articulation teaching was not a means of instruction, but only a branch; that it was adapted only to a small number of pupils; that it was costly (requiring smaller classes); that it was difficult, disagreeable, and wearisome to the pupils; that it could not be used as a means of religious instruction; and that it was imperfect and unreliable as a means of communication. But in spite of this opposition most of the larger schools introduced speech teaching and lip reading for a selected few of their pupils, chiefly those who had learned to speak before becoming deaf. The Second International Convention of Instructors of the Deaf held at Milan, Italy, in 1880, declared itself unqualifiedly in favor of the pure oral method, and the Eleventh Convention of American Instructors at Berkeley, Cal., in 1886, adopted the following resolution: "That earnest and persistent endeavors should be made in every school for the deaf to teach every pupil to speak and read from the lips, and that such efforts should only be abandoned when after thorough tests by experienced and competent teachers it is plainly evident that the measure of success attainable is so small as not to justify the necessary amount of labor." At the Twelfth Convention (New York, 1890) the oral teachers present organized a new body devoted especially to speech work, and in the fall of that year a charter was obtained from the State of New York for the American Association to Promote the Teaching of Speech to the Deaf. The objects of this Association are " to aid schools for the deaf in their efforts to teach speech and speech-reading by providing schools for the training of articulation teachers; by the employment of an agent or agents who shall, . . . by conference with teachers and others, disseminate information concerning methods of teaching speech and speech-reading, and by using all other means as may be deemed expedient, to the end that no deaf child in America shall be allowed to grow up 'deaf and dumb' or 'mute' without earnest and persistent efforts having been made to teach him to speak and read the lips." Dr. Alexander Graham Bell was chosen President of the Association. In the furtherance of its objects the Association has held a number of summer meetings and has entered into an agreement with the Clarke School by which it makes use of the normal class of that school for the training of teachers. At the Fourteenth Convention of American Instructors (Flint, Mich., 1895) a constitution was adopted, and later a Federal charter obtained. The California Resolution was reiterated, and a declaration added that the Convention was "committed to no particular theory, method, or system, adopting as its guide the following motto: 'Any method for good results; all methods, and wedded to none.'" Dr. Edward Miner Gallaudet was elected president. A normal class is maintained at Gallaudet College for the training of teachers on the lines laid down by the Convention.

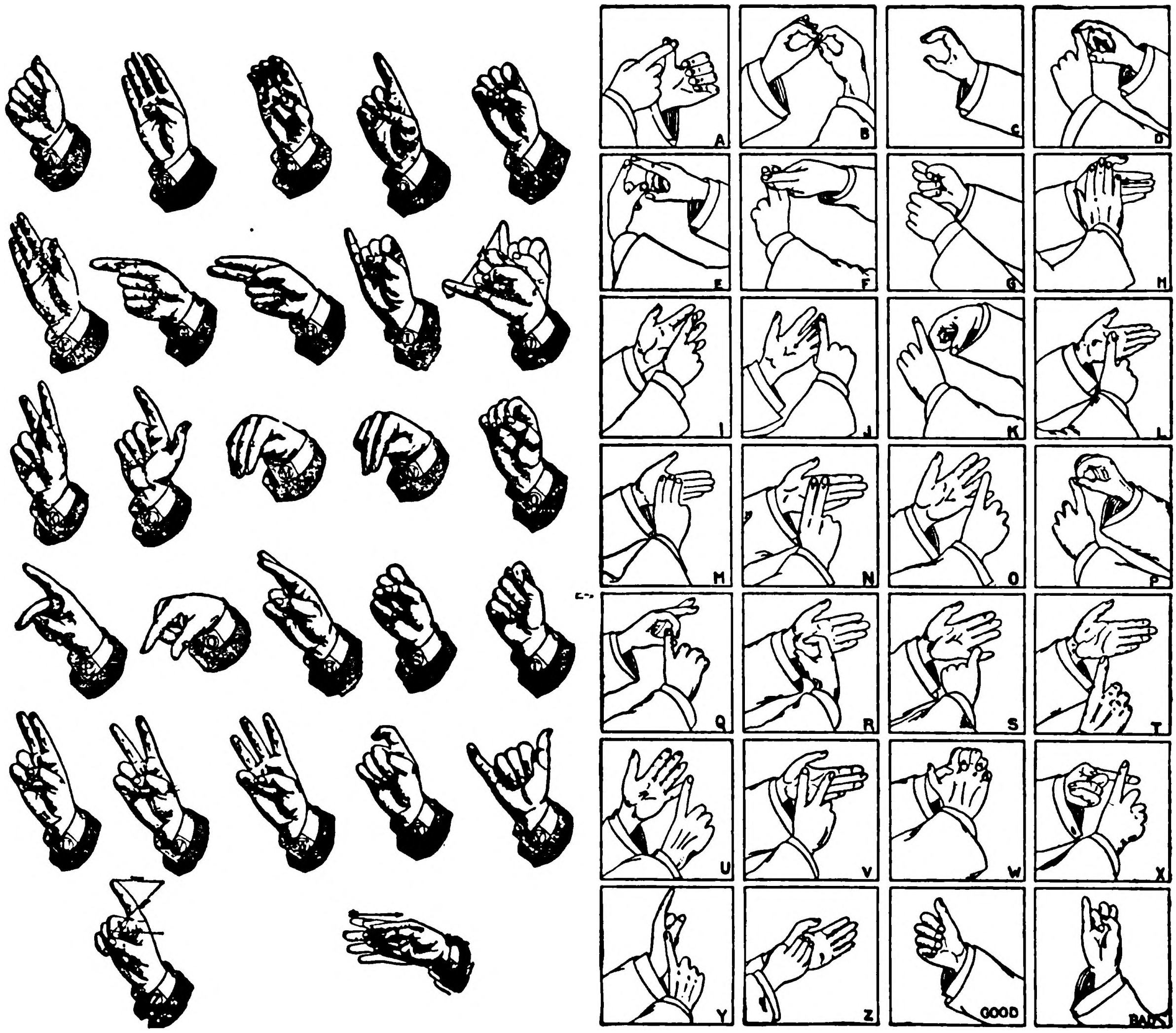
Classification of Deaf Persons. — According to the census returns of the United States and the British Isles there is one deaf person in every 1600. About 40 per cent of the deafness is congenital, and the rest the result of disease or accident. The congenitally deaf are those deaf from birth, and because of their deafness they are dumb or mute. With these are usually included those who became deaf before speech was acquired. The semi-mute are those who became deaf after speech was acquired. Their ability to speak and use language varies with the age at which deafness occurred, and because their speech is more or less imperfect they are termed semi-mute. The semi-deaf are those who have some hearing, often enough to help in the acquisition of speech and language, and the modifying of tones. It should be evident that these three classes require different methods of instruction, but in most schools they receive practically the same. It was probably in Denmark that the first real attempt was made to adapt the instruction to the needs of the pupils. There all new pupils spend the first year together being tested for classification. The semi-deaf and semi-mute are classed together, and the remainder are divided into A, B, and C groups according to their mental capacity. At the beginning of the second year these four groups are sent to different schools, and all are taught orally except the C pupils, with whom silent methods are used. But as all semi-deaf and semi-mute pupils are not equal mentally, there should be a subdivision of that group also. In mental capacity the deaf differ but little from the hearing; there are among them brilliant minds, good minds, fair and feeble minds. The feebleness of mind is often the result of the disease that caused the deafness.

The feeble-minded and backward deaf are a great hindrance to the progress of their classes, and many are discharged as not fit subjects for instruction. If their number be sufficiently great, they may be grouped by themselves, but even then their presence in the school is undesirable. In states like New York and Pennsylvania, where there are several schools, the Danish classification might be easily copied. But if it were not followed in all its details, provision might at least be made for the backward deaf; they are as deserving of proper treatment as the deaf-blind, and are far more numerous.

Methods of Instruction. — In the education of the deaf the aim is the same as that of all other education, *i.e.* the imparting of knowledge and the developing of mind. There are two principal methods by which this is done, the manual, or (as it is called in Great Britain) silent, method and the oral. The latter employs the natural method of human communication, — speech, — and substitutes for hearing the reading of speech by sight from the movement of the lips. The former uses natural or conventional gestures and finger spelling in place of speech. Both methods employ writing and textbooks. In some schools both oral and manual instruction are given. If both methods are used in the same classes, the schools are called combined method schools; if some classes are taught orally and some manually, they are combined system schools. As the manual method was the first to be used in the schools of America, and as it is still employed in most of them, modified more or less by oral teaching, it will be described first. The manual method employs movements of the hands and fingers to express ideas in place of spoken words. These movements may be gestures, either naturally pantomimic or conventionalized, or alphabetic symbols used for spelling words. As examples of the natural signs the following may be cited. *Eat:* the fingers and thumb of the right hand brought together and placed to the lips. *Sleep:* the head inclined and cheek laid on palm of right hand. *House:* the tips of the fingers of both hands placed together outlining a roof. If these three be combined in the order *House-Eat-Sleep*, we have the conventionalized sign for *Home* (the place of eating and sleeping). The drawing of the forefinger horizontally across the mouth from base to tip very naturally suggests "syrup" or "molasses," but when the movement is from tip to base it means "a lie." The forefinger held vertically before the mouth and then thrust forward means "truth."

Some signs, called initial signs, consist merely of the first letter of the word in the manual alphabet. "Character" is the letter C over the heart, and the days of the week are the initials S, M, T, etc., combined with a circular movement of the hand. If the tips of the fore and middle fingers of the right hand be placed on the back of the left fist, as if pricking a potato with a fork, the meaning is "Ireland." In England the thumb pointed toward a person or thing means "good," while the little finger means "bad." An authority on the sign language says that he has used it with an American

Indian, a Hawaiian, a Chinese, the deaf in various parts of the United States, in England, Scotland, France, Germany, Switzerland, and Italy. If by sign language natural pantomime is here meant, it is quite possible, for natural pantomime can be readily understood by any one. Conventionalized signs, however, must be learned even by the deaf, of whom it is claimed by some that signs are the natural language. The order in which signs should be made has been much discussed by teachers, some advocating the order of the words, and others the "natural" order. The following is the Lord's Prayer as rendered by an acknowledged master of the sign language: "Father our Heaven in; name Thy hallowed; kingdom Thy come; will Thy do Earth on Heaven in same. Yesterday to-day to-morrow bread give eat enough. Debts our forgive we others debts their forgive same. Temptation lead in not. Sin trouble sorrow deliver. Kingdom Thy power Thy glory Thy forever and ever. Amen." This inverted order of signs, while perhaps the natural order of ideas, is undoubtedly a hindrance to the acquisition of a knowledge of written English. The alphabetic symbols, easy to learn and use, present real language in its proper form. In the Western New York Institution at Rochester, Dr. Zenas Freeman Westervelt has developed a method that combines the manual alphabet and speech, but excludes signs.



Single-handed. Double-handed.

The Manual Alphabet.

The manual alphabet in both its single-hand (French and American) and double-hand (English) forms, is too well-known to need description. Plates illustrating the two forms are to be found in all dictionaries and encyclopedias, and most children at school learn to use it surreptitiously as a substitute for the forbidden whispering. But few remember it after their school days are over, and thus lose a method of communication that might be of great service and comfort in case of sickness or accident. Robert Louis Stevenson is said to have used it when too weak to articulate. The oral method was the one, as was pointed out above, employed by the earliest teachers who for the most part taught single pupils. It has been very successfully employed in our own times in the home training of deaf children by parents and friends often illiterate and absolutely ignorant of any other means of communicating with the child than by talking to him.

In the teaching of speech to the deaf two methods are employed, the element and the word. These methods are also used in teaching reading to hearing children, but the problem is not the same. The hearing child can already speak the word. He is shown a picture of a cat and can call it by name; he has only to be taught that a certain combination of three letters is another picture of the cat. The deaf child cannot speak the word, and is made to attempt the imitation of the three sounds together, and perhaps succeeds, but he is incapable of pronouncing the word "tack," which contains the same three sounds, and it must be taught as a new word. By the element method the powers of the letters are taught, and the child is shown how to resolve words into their component parts. For no one can pronounce a word until he can pronounce the beginning, the middle, and the end. In teaching young deaf children to speak, the attention is first attracted by gymnastic movements of the body and its parts, which are imitated by the pupil. In the beginning these movements are large, but they are gradually narrowed down to the face and lips and tongue, thus directing the attention to the movements that must be watched in the acquisition of speech and lip reading. By action work, running, hopping, falling, etc., the lip movement of the word of command is associated with the action, and the foundation of lip reading is laid before instruction in speech begins. In the teaching of sounds the aspirates precede the vocal. *p* is shown to be more than a mere closing and opening of the lips by noting the effect of the explosion of breath upon a strip of paper or feeling it on the back of the hand. *t* and *k* are similarly taught. After a number of breath consonants have been taught the open vowel *ah* is given, and contrasted with it *aw* and *oo*, the three showing a large, round opening, an upright elliptical opening and a small, round opening. Combinations of these consonants and vowels are next given, *pah, paw, poo; ahp, awp, oop; pahk, tawk, kaht.* In time all the consonants and vowels are taught and combined. The written form is given as soon as the child is perfectly familiar with the spoken form, taking it readily from the lips of others and speaking it himself.

The elements as taught are placed in their proper places to form the consonant and vowel charts. These charts were originally used at the Clarke School, and are a great help in leading deaf children to become independent in the pronunciation of new words as they meet them in their reading. They have also been used in some primary schools for hearing children, and the ability to read has been acquired much more quickly than by other methods. The Consonant chart when read vertically gives in the first column the aspirated sounds, in the second the vocalized, and in the third the nasal.

o^1o (r)u–e (r)ew	o^2o	o–e oa —— o o^2w	aw au o(r)	-o-
ee —e e^1a e–e	-i-	a–e ai ay	-e- ——y e^2a	-a-
	a(r)	-u- ——a ——a(r) ——o(r) ——er—re ——ir	ur er ir	

a–e ai ay	i–e igh —y	o–e oa —— o o^2w	ou o^1w	oi oy	u–e ew

Vowel Chart.

h–				
wh	w–			
p	b			
t	d	m		
k ck $c\begin{cases}ca\\co\\cu\end{cases}$	$\overset{1}{g}$	n	l	r–
		nǵ		
f ph	v			
t^1h	t^2h			
s^1 $c\begin{cases}ce\\ci\\cy\end{cases}$	z s^2			
sh	zh			
ch tch	j $\overset{2}{g}$— —ge dge		y–	
			(x–ks)	(qu–kwh)

Consonant Chart.

Sounds in the same horizontal row have the same position of the vocal organs, and to the eye appear the same. The lip reader sees no difference between *pan, ban, man; pat, bat, mat; pad, bad, mad.* It is only by his knowledge of language and the context that he is able to know which is meant.

The Vowel chart gives the back and front vowels in series from the narrow to the wide. Those between the two short dashes are the short sounds. The dashes represent the consonants of the words. Two vowels separated by a dash represent the diphthongal sounds. Long dashes represent words with the sounds as final. The alternative spellings have the same sounds as the chart sounds above them. Deaf children quickly learn these rules of position, and apply them in the pronunciation of any words put before them.

But all the drill that may be given on the elements and their combinations, while it may make the pupil read with a fair accuracy of pronunciation, does not impart an understanding of what is read. Any one may learn the sounds of a foreign language and read it aloud sufficiently well to convey ideas to one knowing it, and yet get nothing from it himself. Neither does an ability to read from the lips and repeat what is spoken by others mean that the deaf child has understood what was said. The normal child hears language from the day of his birth, and even before he learns to speak understands a great deal that is said to him. The deaf child, deprived of all this unconscious teaching, must be taught every word and construction as he needs to use it. This is true whether the instruction is given by manual spelling, gesture, or lip movement. It is no easier for him to understand what is meant when t-u-e-s-d-a-y is spelled on the fingers, or the thumb is placed between the fore and middle fingers and the hand waved around in a circle, than it is when the word " Tuesday " is spoken, and he watches the motion of the lips. In every case he must be taught what the signs, manual or labial, mean. It is true that the manually taught pupil can more readily imitate the signs (spelled or gestured), and so his progress at first seems to be greater than that of the orally taught, but every teacher of a primary oral class knows that her pupils are able to take from the lips scores of ideas more than they can speak. The real test of the method should be applied at the end, not the beginning of the course. On leaving school the orally taught have covered as much ground as the manually taught, and there is the added advantage that their means of communication is understood by the public at large.

The most thorough experimentation with the various methods used in the instruction of the deaf was made at the Pennsylvania Institution for the Deaf and Dumb at Philadelphia, between the years 1870 and 1909. At first, as in all the older American schools, the method was manual, instruction being given by signs, spelling and writing. Articulation was introduced first as an accomplishment for those who were thought to be able to profit by it, a few moments a day being given to the use of the vocal organs. Later classes were taught orally, but the pupils were allowed to mingle freely with the manually taught out of school. Next an oral branch, at some distance from the main building, was established where pure oral teaching was given with an oral environment out of the schoolroom. One by one the various combinations were abandoned, until in 1892 it was decided that every new pupil should be placed under oral instruction; from that year onward the oral department steadily grew in size, and with the graduation of successive classes the manual department grew smaller and smaller, until in June, 1909, the Institution became purely oral. These experiments, carefully, slowly, and conscientiously carried out, give Dr. A. L. E. Crouter, the Superintendent, a right to speak with authority on the subject. He began the experiments with no preconceived ideas in favor of oralism; in fact, twenty years of manual teaching before he became Superintendent had, if anything, biased his mind in favor of the manual method. The oral method won on its merits. As a result of these experiments, most schools for the deaf in America now place all beginning pupils in oral classes until it is decided that they cannot profit by such instruction, when they are transferred to manual classes. Just what constitutes success is not standardized. Some claim that any speech, even very poor speech, is better than no speech, and that the friends and daily associates will understand even if it be unintelligible to a stranger. Others seem to think that unless a pupil can speak clearly and distinctly he ought not to be encouraged to use his voice.

The old manual schools did not admit pupils until they were eight or ten years of age, and in six years gave them such a knowledge of English that not a few were able to fill responsible positions. Edmund Booth was the editor of the *Anamosa* (Iowa) *Eureka;* Job Turner was a missionary-at-large of the Protestant Episcopal Church; John Carlin was a painter and poet. These are but a few of the distinguished deaf educated in the first half of the nineteenth century. Those were the days when the common schools turned out great men after a few short terms. With the increase of time in the common schools, the schools for the deaf also gave eight, ten, and even twelve years to their courses. In New York a child entering at five or six, by remaining until he is twenty-one, may have a fifteen or sixteen year course. In Great Britain the course is still short, as all children, no matter at what age they enter, are obliged to leave when reaching sixteen years. The introduction of the kindergarten in the teaching of very young hearing children has led to the establishment of several infant schools for the deaf. The promoters of these schools are of the opinion that if the deaf baby is held in the arms and talked to he will feel the chest vibrations of the mother or teacher. This, together with the lip movements which he is required to watch, forms a substitute for the sound impressions that the normal child is constantly receiving unconsciously through the ear. These conditions often produce lip readers of the highest order, but the immature minds and uncontrolled muscles of the deaf babies do not allow them to speak any plainer than do little hearing children of the same age, and while the hearing child is guided by his ear to correct his faults of speech, the deaf child, having no such guide, becomes more and more fixed in faulty habits of articulation that no amount of after-correction can eradicate. By far better results are obtained with pupils whose instruction in speech began at six or eight years of age.

The day school for the deaf has many advocates among those who believe that the child's place is in the home and cannot bear the idea of his being parted from his parents during those impressionable years when home life means so much to him. The fact that the child is deaf, and for that reason in many cases an object of pity, often strengthens this feeling. These well-meaning people seem to forget that there are hundreds, perhaps thousands, more hearing boys and girls of the same age away from home in boarding schools than there are deaf. These come for the most part from homes of a higher class than do average deaf children, homes in which the parents and friends are better qualified to assist in their education. The theory that the parents and friends will help the deaf child in the acquisition of language is not borne out in practice, since so many either are too ignorant or have no time after a busy day's work to give such help. In the boarding school every one, from the superintendent to the humblest servant, can do something every day to further the child's progress.

With ideal home conditions of care, cleanliness, clothing, and food, all of which receive the utmost attention in the boarding school, and parents who would supplement the efforts of the teachers, as do the attendants in the boarding school, the day school might be best. But with homes as they are, the regular life of the boarding school, with its plain, wholesome food and regular hours, is to be preferred. Another feature of the boarding school that ought to be mentioned is the industrial training, by which every boy and girl is given the rudiments of a trade that they may be prepared to become wage earners when they leave school. There are sixty-four day schools in the United States, and all of them, with but one exception, are oral. Fifty of them are in three states, Wisconsin (twenty-one), Illinois (fifteen; of these twelve are in Chicago alone), and Michigan (fourteen). The day schools are usually conducted as a part of the public school system of the city or town in which they are located, but the boarding schools are mostly classed with the penal and corrective institutions and are under the state board of charities. In some states, however, laws have been passed placing the schools for the deaf under the department of education, where they rightfully belong.

According to the latest statistics (see *American Annals of the Deaf*, Jan. 1910) there were in the United States 145 schools (public and private) for the deaf with 12,332 pupils and 1,673 teachers. Of these schools 80 employed the oral method and 59 the combined method, while 8,878 pupils were taught speech and 7,562 wholly or chiefly by the oral method.

There are two professional magazines, both published in the city of Washington, the *American Annals of the Deaf*, issued under the direction of a committee of the Conference of Superintendents and Principals of American Schools for the Deaf, and the *Volta Review*, the organ of the American Association to Promote the Teaching of Speech to the Deaf. The Volta Bureau for the Increase and Diffusion of Knowledge relating to the Deaf, at Washington, was established by Dr. Alexander Graham Bell, with the Volta Prize awarded to him by the French government for his invention of the telephone. Dr. Alexander Melville Bell (1819–1905), the father of Graham Bell, also contributed liberally to the funds of the bureau. Dr. Melville Bell's Visible Speech Symbols, the most accurate method of recording phonetic values ever invented, are used in some schools for the deaf, and constitute a part of the training of every teacher.

Canada. — The Dominion of Canada has seven provincial schools for the deaf, of which five are combined, and two have separate oral and manual departments.

The total number of pupils (November, 1910) was 832, of whom 499 were taught speech and 399 by speech. The teachers numbered 151; 62 male, 89 female; 15 deaf, 51 oral, 52 industrial. The Canadian teachers affiliate with those of the United States and are members of both the Convention and the Association.

Great Britain. — A little past the middle of the last century the British schools for the deaf had abandoned the method of Braidwood in favor of the French or silent method. In 1866 the Jews' Deaf and Dumb Home was established at London by the Baroness Mayer de Rothschild. William van Praagh was the first principal, and speech was taught after the German fashion. The school was much visited, and little by little the German method was introduced into the older schools. In 1889 a Royal Commission that had been appointed to inquire into the education of the deaf recommended that all deaf children should have " full opportunity of being educated on the pure oral system "; and that the class should be spoken of as " the deaf " and not as " deaf-mutes " or " deaf and dumb," unless they were actually so. To-day the method in England is chiefly oral; in Scotland, combined; and in Ireland, sign and manual. In some schools, professedly oral, there is a movement toward the introduction of finger spelling and the establishment of silent classes for such pupils as are not successes on purely oral lines. In Glasgow and Bristol it is proposed to form separate classes for the semi-deaf. These classes will of course be taught orally. In Great Britain the school period is fixed by law, the compulsory age being seven to sixteen, with two permissive years, from five to seven. By the coöperation of the National Association of Teachers of the Deaf and the central Board of Education the law is enforced, and in recent years the attendance has shown a marked increase. In the English schools the requirements for teachers are far more rigid than those in the United States. By the new regulations of the English Board of Education teachers in schools for the deaf will be required to hold both a Government Elementary Teachers' Certificate and a special diploma relating to work with the deaf. Teachers already employed will be retained as long as they do efficient work and satisfy His Majesty's Inspector. In Scotland and Ireland no rules are as yet laid down. The National Association of Teachers of the Deaf, of which Mr. A. J. Story is Chairman and Dr. W. H. Addison is Vice-Chairman, includes in its membership teachers of all shades of opinions. It holds a conference every two years. The Conference of 1907 was international. The organ of the Association is *The Teacher of the Deaf*, published bi-monthly. The Association seeks to influence public opinion in favor of the deaf. Trade teaching, which forms one of the important departments in the American boarding schools, is almost unknown in Great Britain, manual training and sloyd being thought sufficient. Two or three schools have, however, introduced real trade teaching. Anerley (London) led the way, and was followed by Margate. The pupils spend half the day in school and half in the workshops. Manchester has recently opened a trade school for boys over sixteen who work at their trade all day and attend evening classes. In Jan. 1910 there were 52 schools for the deaf in Great Britain with 4,653 pupils and 468 teachers. Of the schools 26 used the oral method and 14 the combined method.

France. — The Abbé de l'Épée died at the opening of the Revolution of 1789, and the Abbé Sicard, who had been sent from Bordeaux to study methods with a view to establishing a school in that city, was appointed his successor. In July, 1791, the Assembly converted the school into the National Institution for the Deaf and Dumb, and in 1794 it was moved to the Seminary of Saint Magloise, in Rue Saint Jacques, where it still remains. In 1859 the sexes were separated, the girls being sent to Bordeaux. Until 1879 the French schools followed the manual method of de l'Épée. In that year it was decided to introduce the oral method into the school at Bordeaux, and in the following year it was introduced at Paris. The Congress at Milan (1880) confirmed this action, and soon all the schools in the country followed the example set by the two principal national institutions. In the Paris institution boys are taken at the age of six in a special *classe enfantine*. Their regular school course does not begin until they are nine. The school period is usually eight years, and all must leave at twenty-one. There are at present nearly two hundred seventy-five pupils. In May, 1907, there were in France sixty-five schools for the deaf, with an attendance of 3894. Four of these were national institutions, the others private. Thirty were mixed schools, with the boys and girls always in separate classes; sixteen were for boys only and nineteen for girls.

Germany. — Amman was the real founder of the German method. Heinicke devised no new method, he merely followed the one that Amman had practiced so successfully. Heinicke, however, deserves credit for fearlessly insisting on the teaching of speech and teaching by speech. The greatest of all German educators of the deaf was Friedrich Moritz Hill (1805–1874) of the school at Weissenfels, Prussian Saxony. The keynote of his method was the development of speech in the deaf child in the same way that nature develops it in the hearing child. While condemning conventional signs, Hill allowed the use of natural signs in the lowest classes, gradually substituting spoken language for them, the use of signs being a hindrance rather than a gain in the acquiring of speech and lip reading. In the German schools of to-day oral language and lip reading are the chief objects of instruction from the beginning of the course. The written form is added when needed. In the middle stages the work closely resembles that in the ordinary schools for the hearing, and in the upper grades it does not differ from it at all. There were in 1909 (see *Radomski's Taubstummen-Anstalten Deutschlands*, 1909), 89 schools in Germany with 7,226 pupils and 829 teachers.

In most of the countries of Continental Europe the oral method is chiefly used.

STATISTICS OF CONTINENTAL SCHOOLS[1]

COUNTRIES	SCHOOLS	TEACHERS	PUPILS	METHODS (Not always reported)
Austria-Hungary	38	277	2339	Mostly oral. Five combined.
Belgium . . .	12	181	1265	Oral.
Denmark . . .	5	57	348	Oral. See text.
Italy	47	234	2519	Oral. Nine report the Manual Alphabet in addition.
The Netherlands	3	74	473	Oral.
Norway . . .	5	54	309	Similar to Denmark.
Portugal . . .	2	9	64	One oral, one mixed.
Russia	34	118	1719	Twenty oral. Others mimic, manual alphabet, etc.
Spain	11	60	462	Three oral. Seven mixed.
Sweden . . .	9	124	726	Similar to Denmark.
Switzerland . .	14	84	650	Oral.

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[1] These figures are from reports made to the Volta Bureau, 1901.

There are a few schools for the deaf in South America, South Africa, Australia, and India. In Corea, at Pyeng Yang, and in China, at Paoting, there are two schools with teachers trained under Mrs. Mills at the Pioneer School at Chefoo.

E. S. T.

See BULWER, JOHN; DEAF-BLIND, EDUCATION OF.

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DEAF-BLIND, THE EDUCATION OF THE. — The deaf-blind are, fortunately, a small class, and a large portion of them have been stricken late in life, so that when these, together with the feeble-minded, are deducted, there remain only a small number who can be educated. The German census for 1900 reported in a population of 60,000,000, some 34,000 blind, 49,000 deaf, and 340 deaf-blind, that is, one deaf-blind among 145 deaf. A Swedish statistician found 90 deaf-blind among 2100 deaf whom he studied. Instances of the education of the deaf-blind are reported in America, England, Germany, France, Sweden, and Norway. Owing to the influence of the pioneer work and the fame of Dr. S. G. Howe, the largest number of recorded cases of deaf-blind who have received instruction are found in America. Mr. William Wade gives the names of about sixty in the United States and Canada deaf-blind from childhood, and the name of a deaf-blind person is not likely to be recorded unless some one has tried to teach him. Only a few names have come down of deaf-blind persons who lived before the time of Laura Bridgman, and yet there have been hundreds in the world since the work of teaching the deaf began. Among the deaf-blind in Europe and America who have been under instruction and have been most fully studied and reported upon may be mentioned Laura Bridgman, Helen Keller, Ragnhild Kaata, Marie Heurtin, Hertha Schultz. The records of the deaf-blind are to be found in a large number of reports and biographies, most of which are devoted to individual cases. There is no general work on the subject which embodies what is known at the present time of the methods of teaching the deaf-blind and the bearing of their education on psychological and pedagogical questions. Apparently some of the teachers of the deaf-blind in Europe approached the problem with little knowledge of what had been done by Dr. Howe and others. The increasing unity of knowledge in the modern world of education, and the great popular interest in the achievements of one or two of the deaf-blind, make it unlikely that in the future any teacher will begin work with a new pupil without having become familiar with the labors of other teachers; the same considerations warrant the hope that hereafter all the educable deaf-blind in civilized countries will be reported and placed under instruction.

Much of the published writing on the education and psychology of the deaf-blind is the work of those who have studied printed reports rather than the deaf-blind themselves; one cannot say that there has been too much of this kind of writing, for any expression of interest, which in turn can be the cause of interest in others, is a gain. But is should be said that no teacher, psychologist, or philosopher should draw any conclusions from the history of the deaf-blind until he has sought out several of them and talked with them. The manual alphabet can be learned in a few hours, and by means of it an intelligent person can discover for himself the general level of education which any deaf-blind person has reached. There is no excuse for so many *a priori* utterances about the capacities of the deaf-blind as the learned have in the past sent forth with all the air of conviction and authority. And the statements of well-meaning amateurs are equally misleading, such statements, for instance, as that "none of the many successful teachers of the blind-deaf ever had any experience in the work," and that "any good teacher in our common schools, particularly in kindergarten work, is fully qualified to teach a blind-deaf pupil, after she learns the manual alphabet." There is very much more to learn than that, and there seem not to be "many" who have learned it. Much else has been written about the deaf-blind which tends to obscure the lessons that are to be learned from what has been done, and so tends to retard rather than advance the work for the deaf-blind and for the deaf. The natural generosity of the human heart makes it glad to accept exaggerated statements about the success of children who are doubly handicapped; and only by the most careful analysis of the facts and principles involved can we understand this small corner of the great world of education, a corner which holds much of encouragement and enlightenment for all teachers.

Dr. Howe quotes from Blackstone's *Commentaries* the following law: "A man is not an idiot, if he hath any glimmerings of reason so that he can tell his parents, his age, or the like matters. But a man who is born deaf, dumb, and blind is looked upon by the law as in the same state with an idiot; he being supposed incapable of any understanding, as wanting all those senses which furnish the human mind with ideas." From idiocy to Helen Keller's article on the Blind in this work (*q.v.*) what a flight of the human spirit! No department of human endeavor that is affected by the education of the mind of a child — and is there any department not affected? — can be quite as it was before Dr. Howe gave Laura Bridgman her first lessons. Laura sat beside him, her fingers on a key. Pasted on the key in raised type were the letters, k-e-y. On another slip the letters were repeated, k-e-y. She felt the key and the raised letters on the two slips, perceived the similarity, and inevitably. after many trials, there was formed in her mind an association between the two sets of touch sensations, the shape of the letters and the shape of the thing. The association was precisely the same that forms in the mind of the normal child between the sensation of touching and seeing the key and hearing at the same time the word "key." In many lessons there were formed in Laura Bridgman's mind associations between other groups of raised letters and corresponding objects. The first important. change in the physical means of instruction was the substitution of the manual alphabet commonly in use among the deaf in place of the printed labels. Here again, the work of the teacher was to present to Laura an object, ball, book, or mug, and at the same time to form the manual letters that spelled the name of the objects with the pupil's hand upon the teacher's. These manual letters did not, be it understood, enter the child's consciousness *qua* letters, but as movements of the hand; the same movements were invariably associated with the same objects, each collocation of the finger motions repeatedly for many weeks and months accompanying its object until the association was firmly made, and until the child grew to expect that any newly encountered object or act should have its appropriate finger word. The means of educating the deaf-blind had been found.

The next important step forward was made in the first lesson given to Oliver Caswell by Mrs. Mary Swift Lamson. An account of this lesson is to be found in an appendix of Mrs. Lamson's *Life of Laura Bridgman.* She began immediately with the manual alphabet, and in half an hour she gave Oliver Caswell the notion that all things have names, — a conception that it had taken Laura Bridgman nearly three months to arrive at. That appendix may be regarded as the most advanced statement of method that had been written at that date, 1879. In the following criticisms personal credit is of little importance; the intention is to explain what happened in one case and another, for the guidance of future teachers. With this end in view much of what follows has been thrown into the form of injunctions and criticisms addressed to an imaginary teacher at work with a deaf-blind child.

Before following the development of the method of applying the manual alphabet in teaching the deaf-blind, it should be recorded that in the education of Ragnhild Kaata, begun in Norway in 1888 by Mr. Elias Hofgaard, the manual alphabet was not used; the first lessons were given by placing the hand of the pupil on the lips of the instructor. In this case the principle of association between certain movements of the organs of speech and the object represented by those movements was precisely the same as between manual spelling and the object, or, in the case of the normal child, between the object and the sound of the spoken word striking the ear. The difference between Mr. Hofgaard's work and that of most other teachers of the deaf-blind is one of instrument, not of principle. The manual alphabet is a preferable instrument, requiring less strain on the part of the pupil, the large letters formed by the hand being more boldly differentiated than the finer movements of the lips. Some of the deaf-blind can learn to speak and read the lips, but this acquirement should follow the acquirement of language.

With the deaf-blind, as with the deaf, the main problem is the teaching of language. Whoever has command of a living language is educated. Other knowledge follows language or is implicit in it. Deafness and blindness dam up two streams of stimuli from a world of objects, but — worse loss to the brain — deafness closes the channels of speech, speech that carries to the normal child the very stuff of education. Through the fingers of the deaf-blind it is possible to direct two vehicles of language, the manual word and the printed word. This printed word will be the embossed type used by the blind, and it should be taught as soon as possible after the manual word has given the pupil his first clews to language. The skillful teacher can combine manual conversation with the game of hunting words on the embossed page, and, by exciting the curiosity of the pupil, coax him to follow a story in print. Formal reading lessons should be guarded against, lest the child conceive a distaste for his book. If a dog out in the yard has interested the child, it will not require great cleverness on the part of the teacher to trace the dog into the pages of a book and keep the child in excited pursuit. Reading is of the utmost importance in supplying new words and new interests.

The essential mind of the deaf-blind child is not different from the normal; it has the same instincts and impulses, the same desires communicated from an appetitive body, and the same power to invent, imagine, recombine, and reflect on what it receives. The study of the mind hedged in by defective senses is a subject which the psychologists should systematize; a good book on the subject would be of utmost value to the teacher. Not enough emphasis has been put on the sense of touch, which is the great sense. The whole skin sees and listens, and not only the skin, but the entire body, bones and muscles. Psychologically, and as a matter of biological history, hearing and sight are only specializations of the sense of touch, and as the parent of these senses it has many capacities which in normal people have been appropriated by the finer offspring; these capacities are still available in the redemption of the mind of the deaf-blind from idiocy. Through them by tactual experience of the outer world, combined with a language which is instinct with the wisdom of the race, the twice-buried mind can know the sun, the sea, and the stars.

The task with the deaf-blind child is to cultivate the sense of touch so that it shall convey the greatest possible variety of experience, to keep the child in a state of constantly interested action, and to pour into the mind in its interested and aroused moments a stream of language. The chief limitation of touch is its slowness in doing some of the work normally done by the ear and eye. It takes longer to flood the deaf-blind child with words than for an equal number of words to reach the mind of the normal child as they fall from the lips of his parents and companions. The records of Laura Bridgman show that her lessons occupied but three or four hours a day. This is not enough. The early lessons are not schoolroom exercises analogous to what the normal child is subjected to when he first goes to kindergarten; they are analogous to what the normal child receives before he goes to school at all. They should be play, and they should go on all the time that the child is awake and active. The teacher must put away grown-up things, and become the playmate of the pupil, taking the place of the normal child's associates who use spoken words. And all the family and friends of the deaf-blind child should learn the manual alphabet, and use it on every possible occasion. Language study should at the beginning be pleasant; the child should not think of it as a task. To teach language, or anything else, the teacher must have the interest of her pupil. One cannot expect to hold the attention of a little child very long on one thing. The hearing child learns language while he is attending to something else, his dog, his food, his toys. When the deaf-blind child begins to fidget, he is for the moment past learning. The bugbear, discipline, should be banished, until the child has some language, some moral sense to appeal to. Certain kinds of discipline must be enforced, as with an animal, but that is a different matter from discipline in relation to language lessons. I have seen little deaf children bored to death with exercises which they were required to write over and over again until the lesson was "perfectly" learned. That sort of teaching is worse than wasted. It inspires in the child a distaste for knowledge. Even a child has a right to resent being bored. The advantage of novelty outweighs the benefit secured by "sticking" to a task.

The need of spontaneous interest on the part of the deaf-blind child — and the normal child, too, — cannot be too strongly insisted on. In the case of adult pupils, and to some extent in the case of young normal pupils, discipline and duty can be summoned to force attention to a dull teacher. In the case of a deaf-blind child, there is no moral sense to count on. The moral sense is an adult acquirement that follows a knowledge of language. It is almost pathetic to read in the records of Laura Bridgman and Marie Heurtin of the premature efforts of the teachers to discover or develop a moral sense and a religious faith in minds that had hardly enough vocabulary to make known simple material facts and desires. Our views of morality and deity are no more comprehensible than astronomy to a deaf-blind child who has not yet got hold of a simple vocabulary and the common facts of life about him. In the first stages it is his meanings, his desires, that we are seeking to open and clarify.

When a deaf child interrupts a lesson with something he is eager to tell, the teacher should try to get at his intention, and, by throwing in a word here and there, to help him to self-expression. Do not stop the flow of his narrative with "You must say 'I,' not 'me.'" Simply help him to say his thought, and so build his language. Grammar is of importance only to grammarians, and the difference between a preposition and an adjective is of no consequence to the child. The differences exist in what he is doing, but he cannot be conscious of them. So that all discussion of "how to teach adjectives" and "how to teach verbs" is wasted breath. The child learns nouns first, because they name his crudest tactile experiences, but he learns all parts of speech in precisely the same way, because they express things and relations of which he is conscious at the moment when the words and series of words are spelled into his hand. One reason that deaf children do not learn language better is that they are not allowed to use imperfect language freely. The instinct to use language for the purpose for which it exists — to communicate — is checked by the zeal of the teacher to improve grammar or idiom. Lead the child's idioms, but do not correct them. If the teacher uses correct and abundant language, the deaf child will use correct language in time by imitation. A normal child brought up in a cultivated intelligent family and sheltered from corrupting influences could not, if he tried, use very bad English — unless he were clever enough to invent it. If a deaf child is "corrected" in the act of expression, the interesting fact which he wishes to communicate is forgotten. He is discouraged when he finds so many difficulties, and he resorts to signs or pantomime. Let the teacher tax her wits to get the meaning from his stumbling words, and not block him in his impulse to use words. Some day she may be able to revert to the incident which he has imperfectly explained, and make a "language lesson" of it. But while the child's interest is hot upon his narrative, of the cow he has seen or of how he cut his finger, any word of the teacher which distracts him is to be deplored. His words should stand for living thoughts, not our thoughts, not book thoughts, but his thoughts. The prattle of the normal infant is spontaneous; and how imperious is the desire to express thoughts, how really varied a child's thoughts are! Imagine the effect if a zealous parent were ever at the elbow of the normal child insisting that the little one use only correct sentences fashioned according to adult Olympian standards. It is hard to kill the instinct to talk, but it can be done — in schools for the deaf — by making language work an abstraction detached from life and growth, to be laid aside the moment the pupil is let out of the classroom, and so inevitably associated in his feelings with strain of mind and body.

In trying to convey an idea to a deaf-blind child it is often sufficient to place contrasting ideas in juxtaposition, to put a small object beside a large one, a soft substance beside a hard one. In this way "adjectives" are learned without difficulty. In the same way abstract ideas are grasped and remembered, if the teacher seizes the right moment. Some day she will find her pupil in a temper. Ask him quickly why he is angry. Imitate his behavior. Show him his sister playing with her doll. She is not angry; she is good and happy. He knows his own state of mind as well as anybody knows it, and he will learn the words that express it. The child's own sensations and emotions supply all the explanation that is necessary. The words spelled in the manual alphabet, the twist of fingers, will become associated with the thing, with the fact; he does not know, and does not need to know, that the manual word is a combination of letters, any more than the normal three-year-old knows that the sound "mad" is a word, an "adjective" of three letters.

Bright, deaf-blind children, before they are taught, acquire many signs by means of which they often vainly strive to express their obscure but varied sensations. Before the time when language becomes second nature, they are made restless by thwarted efforts to communicate. This shows that the will to speak is in the nature of the human being. But the instrument of speech, the civilized language, is a slow growth, an artificial instrument, the use of which must be acquired, and acquired properly, like the art of playing the violin. Dr. Alexander Graham Bell says of Helen Keller's "wonderful familiarity with idiomatic English": "She is such an exceptional child that we are apt to attribute everything to her marvelous mind, and forget that language comes from without, and not from within. She could not intuitively arrive at a knowledge of idiomatic English expressions. It is absolutely certain that such expressions must have been *taught to her* before she could use them." Granting all varieties of capacity in human minds, there must be indispensable right ways to teach language to the poorest intelligence, and ruinously wrong ways to teach language to the finest intelligence. The individual in learning language comes in contact with a highly elaborate instrument that has grown up with the race and has been refined and amplified by the great artists and thinkers who have used it. To be initiated into the use of it the individual must come in contact first with the parts of it that express his sensations and experiences; and so he proceeds through language itself, from the little of it that expresses him into its riches that express very much more than the individual; thus he becomes "educated." Without the personal contact between his impulses to utter and the borders of the great language he will never learn it, though its entire vocabulary be dumped into his memory. Deaf persons through patience and industry have been able to amass a truly wonderful vocabulary. They could spell correctly, write legibly, make neat sentences in which every word was correctly used. Yet when they tried to say or write their own ideas, they fell into "mutisms," and showed that they did not in any true sense know language. So long as words are known only as words, they do not constitute language. If one knew the dictionary from A to Z, one might still be unable to merge a hundred words into intelligent, idiomatic, adult discourse. Language by itself is dead. It must grow in relation to life. Teaching language to a deaf-blind child, or to a normal child, should consist in catching the vital impulse to utter, whenever it shows itself, and supplying the means of utterance. Unique unforeseen opportunities start from every chance observation that the pupil makes of his surroundings. He will meditate upon two similar experiences and try to find the way to express the combination. The mind has a sense of relations, of joints and connections, and it is in obedience to this sense that our language has "parts of speech," words that express relation. The deaf-blind child perceives sweetness as well as a normal child. If, simultaneously with his experience of the sensations, there are spelled into his hand "sweet apple," "sour apple," "sweet sugar," "sour lemon," "bitter quinine," he will not, as has been thought, mistake sweet apple for a compound word — and it will do no harm if he does! His mind will in time sort out the words that go with his experiences. Joy, sorrow, love, hate, surprise, and disappointment are just as cognizable by a deaf-blind child as by a normal child. But if a young deaf-blind child, or a normal child, never has experienced surprise and does not know the names of enough other emotions to explain it by, "language lessons" will never teach him the word "surprise." The transition from physical to intellectual things and qualities is easy; it is certainly no more mysterious in the deaf-blind than in those who see and hear. When a deaf-blind child knits his brow over a perplexity, and the teacher taps his forehead and spells "think," the child knows how it feels to think; he understands, therefore, as much of the content of that great word as he needs at the moment. He has nibbled the edge of the word; in time he will swallow it all, with its enormous suggestion, and so come to understand what "a great thinker" is. It may bother us to understand how he learns an abstract quality, but it does not bother him; he merely recognizes a fact and gets the name of it. One word learned in the right way stimulates the mind and makes it eager for another. Once the child has asked out of his own head, "What is it?" the main difficulty is past; the face lights with pleasure. (See the account of Oliver Caswell's first lesson in the *Life of Laura Bridgman* by Mary Swift Lamson, and the account of how Helen Keller learned "water" in the supplement to her *Story of my Life.*)

The teacher has much to think about in order to avoid wrong methods of teaching, but needs only a little ingenuity to find abundance of lessons that almost teach themselves. A startling incident can be dissevered from its context in a book and described with enthusiasm, such as a dog biting a cat or a horse running away, something "sensational" that a child likes to talk about. The detached episode will often assure the attentive reading of the whole story, and many words are absorbed in the process. The child likes to talk about himself. He is the hero of the drama, and his egotism is a very important stimulant. A story about the day's events, which he knows as well as the teacher, makes a first-rate language lesson. Put in incidents that did not occur, and see how eagerly he will set you right. A chase after a butterfly — the best schoolroom is out-of-doors — contains a volume of language lesson. The curiosity must be continuously aroused, for blindness and deafness shut out many of the interesting accidents that accost the senses of the normal child. The why? what? whither? when? must be stirred by surprises and invented episodes. Some confusions, not very damaging if they occur, may be avoided. Abstract words are often blurred because they are taught together. Laura Bridgman could not dissociate "punish" from "blame," because the right moment was probably not chosen for teaching the words; they were given to her together in connection with one "naughtiness." It is a mistake in the early stages to try to illustrate one abstraction by another. It is better to use contrasting experiences, that each may remain clear and distinct with its vocabulary. But life itself will teach the teacher, if she is apt to learn, and if she understands thoroughly the fundamental nature of the thing she is trying to do, interfuse a language with the life of the child.

After the deaf-blind child has acquired sufficient language for working purposes, the process of teaching articulation may be begun. The method is much like that of teaching speech to a deaf child who sees. The deaf child watches the teacher's lips and imitates. The deaf-blind child puts his fingers on the teacher's organs of speech, and imitates their position. This is a very important and useful acquirement, and if a deaf-blind child cannot be interested in the process, cannot be taught a crude articulation, this would seem to indicate that the child has not thoroughly learned language by means of the manual alphabet. Spoken language is for the deaf-blind child a means of speaking to his friends and family; less cumbersome than the manual alphabet, and the process of learning it gives the child a living sense of the faces and expressions of normal human beings, and so enables him by imitation to put expression into his own countenance. It is another bond of contact with normal life. A natural voice has not yet been developed in any deaf or deaf-blind person, but it might be done if the physiology of the voice were studied as a good teacher of singing understands it, and if this knowledge were combined with knowledge of teaching the deaf. A. S. M.

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DEAFNESS. — The inability to hear normally. Deafness may be of any degree, from the stage exhibited by the individual who is "hard of hearing" up to complete deafness, which latter is usually due to deterioration in the inner ear or the auditory nerve. If the defect is due to disease in the outer ear, the sound vibrations may be conducted to the inner sensitive organs through the bones of the skull. There are various defects of special types which do not involve actual loss of hearing, but are nevertheless called deafness. Tone deafness (often classed erroneously as mental deafness) is the inability to appreciate the pitch of tones. It is probably due to peripheral defect (in the basilar membrane). In some cases there are gaps in the tonal scale while the rest of the scale is normally received. Mental deafness is the inability to interpret auditory impressions because of defects in the central nervous organs. C. E. S.

See Deaf, Education of the; Ear, Hygiene of.

DEAFNESS IN SCHOOL CHILDREN. — See Ear, Hygiene of.

DEATH RATE OF SCHOOL CHILDREN. — See Mortality among School Children.

DEBATING IN SCHOOLS. — Debating, or more technically disputation, was the distinctively oral method of mental discipline in an age before the introduction of the printed book. In the Middle Ages (*q.v.*), preparation in theology, law, medicine was carried on in Latin by means of systematic disputations conducted in the presence of seniors who had won their reputation by disputational skill. Dialectic or logic was thus the chief of the seven liberal arts (*q.v.*) before the Renaissance, as rhetoric was the chief art exercised after that period. The dialectic disputation concerned itself with the subject matter of grammar in the early stages, with that of theology, law, medicine, in the later stages, and throughout all studies medievalism displayed the greatest ingenuity in bringing all the details and combinations of details of these subjects into the metaphysical arena, in all cases reducing the point in dispute finally to a principle founded or supposed to be founded on Aristotle (*q.v.*). The disputational method therefore was based on authority, and in its exercise reacted so as to intensify the need for final authority. When the Renaissance opened up vast vistas of knowledge requiring inquiry with an open mind, authoritative Aristotelianism was doomed, and the introduction of other methods more suited for inquiry became more urgent; but even in the universities the method of the disputation persisted as the recognized test for higher degrees and the maintenance of a thesis, now usually a written exercise, and *viva-voce* examinations are present-day survivals. Valuable as the disputation was as a mental discipline in ages when there were no texts, no books of reference, information, and criticism, it led to great abuses. Vives (*q.v.*) in his *De Disciplinis* (1531) says of young students: "One disputation a day does not suffice, nor two, as with eating. At breakfast they wrangle, at supper they wrangle, after supper they wrangle. In the house they wrangle; out of doors they wrangle. . . . In every place, at every time, they are wrangling."

The disputation was a school as well as a university method. In the twelfth century, Wm. Fitzstephen gives an account of London schoolboys from different schools assembling on holy days "about the church" to "dispute." "Some use demonstrations, others topical and probable arguments; some practice enthymemes, others are better at perfect syllogisms; some strive like adversaries, others for truth." In 1518 Dean Colet in his statutes for St. Paul's School forbade his school to join in the disputation at St. Bartholomew's. But after the Reformation, disputational power in holding their own in the religious controversies was greatly valued, and both Roman Catholics and Protestants were inflamed with zeal to train their disciples to skill in the disputational method. The Jesuits (*q.v.*) in their schools carried the method to high development, and the English universities, in the time of Elizabeth and later, tightened their hold on the disputational method in view of the religious controversies. The grammar schools (*q.v.*) followed suit; but the subject matter in the latter was chiefly grammar, a subject which had undergone enormous development after the Renaissance, being closely connected with the reading of the new world of classical authors, which had come within the ken of the students. The chief textbook on grammatical disputations was by John Stockwood, head master of Tonbridge grammar school, entitled: *Disputatiuncularum Grammaticalium libellus, ad puerorum in Scholis trivialibus exacuenda ingenia primum excogitatus*, 1598. Between 1598 and 1650 this book in Latin passed through six editions. Stockwood's argument is that, grammar being the main business of the school course, pupils have already in their knowledge the materials out of which they can best be expected to form opinions and judgments by arguing upon them. In 1612 John Brinsley (*q.v.*) in his *Ludus Literarius* devoted Chapter XVII to grammatical appositions, showing " how to dispute scholar-like of any grammar question in good Latin." He strongly recommends Stockwood's book, and advises that the pupils observe " as much as may be, Mr. Stockwood's phrase, his order and witty conceits, which he useth both in objecting and answering." Charles Hoole (*q.v.*) in the *New Discovery of the Old Art of Teaching School* (1660) introduces the method of dividing a form into two " sides " (showing the influence of the Jesuit method). " Let every one propound to his opposite two or three questions which he thinks most difficult out of his week's work, which if the other cannot answer readily before he count six or ten, in Latin, let him be *captus*, and the questions be propounded to his next fellow. The lowest in the form may begin the dispute, and so go on to the highest on either side, who should keep reckoning of those that are capt and how often." Hoole has a similar system for " capping " Latin and Greek verse.

Thus the method of disputations developed out of the method of " appositions," that is, setting of questions orally by one boy to another in a class, or of the master to various boys in a class, as an oral text or examination of work done. This was commonly done on Fridays as a résumé of the week's work. It provided an opportunity for the discussion of any difficulties which required clearing up or emphasis. The method of apposition spread from the grammar school into the elementary or " petty schools " as we see in Coote's *English Schoolmaster*, the most extensively circulated elementary textbook up to 1660. F. W.

In America. — The necessity for possessing a speaking knowledge of Latin was no longer felt even in the colonial period (*q.v.*), and the chief means for perpetuating disputation as a prominent educational method was for the facility which it gave in public speaking and the logical training in argumentation, chiefly in theological discussion or presentation. Hence there was little or no need of perpetuating disputation in the Latin grammar schools, and little evidence exists that it formed any part of this training. In the colleges it was different, and disputation formed a prominent part of college work, both throughout the year and especially in the commencement exercises (*q.v.*). In the *Proceedings of the Massachusetts Historical Society*, for 1800–1881 (Vol. 18), there appears a long list of several hundred subjects of disputation given by Harvard students from 1655 to 1790. These relate to the greatest variety of subjects, including political, social, philosophical, scientific, medical, legal, ethical, scriptural, ecclesiastical, and theological. While many of these reveal a medieval attitude of mind in their statement, many on the contrary are quite modern. " Are polished manners an ornament to a man? " was discussed several times, beginning as early as 1727, a generation before the writings of Rousseau and Chesterfield. The same year saw the discussion, " Is unlimited obedience to rulers taught by Christ and his apostles? " and five years later, " Is the voice of the people, the voice of God? " In 1781 " Is the diffusion of knowledge among all citizens necessary to the existence of the Republic ? " was one among many political and social questions propounded. " Can independent beings be created by God? " " Are intelligences composed of matter? " " Does a shadow move? " " Is there a stone that makes gold? " " Was there a rainbow before the deluge? " " Ought physicians to pray for the health of people ? " " Is there a nervous fluid ? " are samples of these questions in a variety of fields.

During the latter eighteenth century and the early nineteenth, the rise of national interests, the development of patriotic fervor, the increased influence of the legal profession, the opportunity for power to be acquired by the popular orator, put a new value on debating and changed its character. It now ceases to have any connection with the study of the Latin language, takes a new and larger place in the work of both school and college, and comes to be recognized as a distinct branch of study or educational activity in both. Even the elementary school now attempts to prepare for exercises in disputation by the training in declamation (*q.v.*). This prominence of debating as a practical preparation for public leadership, though directed toward the development of self-confidence on the part of the pupil rather than of a command of better English, continued until after the Civil War period. Subsequent generations of schoolmen have come to give debating a place in school activities chiefly as a part of the training in English and only secondarily as a direct apprenticeship to public activity, chiefly of a political or professional character. P. M.

Debating in schools at present. — There is now, however, a well-marked tendency among

American colleges to establish departments and chairs of public speaking entirely separate from the department of English. One of the foremost subjects of study taught by these departments is debating. A debate is an oral contest in which one contestant tries to convince an audience of the truth of a definite proposition while the other tries to demonstrate its falsity. An opinion upon some topic is stated in the form of a proposition, and sides are chosen, one to uphold the affirmative and the other the negative. Both sides are allowed the same amount of time to present their respective cases, and equal additional periods, in which to criticize or rebut the opposing contentions. A decision is usually rendered in favor of the more convincing arguer. Although debating is taken up even in the secondary schools, both as a part of the curriculum and as an extra student activity, still it is more properly a college subject. At college it is regarded as the most important part of the general training in public speaking. Its pedagogical value lies in the fact that it is a powerful agent in adjusting the student to his environment. The subjects for modern debate deal with current political, social, economic, and moral problems. Such resolutions as: Resolved, that the United States relinquish control over the Philippine Islands; Resolved, that direct nominations be established in New York State: Resolved, that there should be a physical evaluation of railroads engaged in interstate commerce; and Resolved, that immigration be further restricted by an educational qualification, force the debater to study the world about him and become well acquainted with it. Furthermore, the questions are so worded that they are capable of practical demonstration; their settlement depends upon a careful and wide observation of concrete facts, and not upon the working of a brilliant imagination or the manipulation of abstract, logical formulæ. (See the list of subjects given above, debated at Harvard over a century ago, for a contrast.) Dialectic agility and a store of authoritative opinions no longer win debates; a knowledge of verifiable facts and clear inferences from those facts are essential to victory. But besides being trained to carefully search out trustworthy facts as the basis of all his opinions, the student is taught how to arrange and present all his evidence in spoken form so as to convince others. The habits of careful judgment and precise expression cultivated by practice in debate are invaluable to any man, whether he becomes a public speaker or not.

As a part of a general course in public speaking, which has for its ideal the training of the student to most adequately express his thoughts on any subject in an extemporaneous manner, the debate is most effective, for the following reasons. First, the student has a definite topic upon which to speak; second, he has a limited field for investigation, and he is forced to seek good reasons for what he says within that field; third, the logical sequence of treatment helps him acquire the power of formulating an address without the help of notes or memorizing; fourth, the contest stimulates his interest. Probably no subject in the entire college curriculum does more to correlate a student's knowledge in all branches, to stimulate his mental activity, to bring him in closer touch with his environment, and to make him more capable of reacting beneficially in that environment, than debating. E. P.

See Declamation; Universities (for disputations in the early Universities).

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DE BIRAN, MAINE. — See Maine De Biran.

DECISION. — That phase of mental activity in which a volitional tendency reaches its completion. The word is commonly used only where there has been some deliberate choice.

See Choice; Control; Volition.

DECLAMATION IN THE SCHOOLS. — **England.** — The grammar school of the sixteenth and seventeenth centuries did not achieve its full purpose on the secular side unless it not only brought the pupil to a wide reading of the classics, and to a power of writing written Latin, but also developed fluency of Latin speaking. The declamation, therefore, originally implied the pronouncing distinctly, and with elocutionary effect, the composition which the pupil had prepared on a given subject. Declamation was thus closely connected with the theme. Charles Hoole (*q.v.*) says (1660): "After you have shown the boys (of the form) how to find subject-matter and where to help themselves with words and phrases, in what order they are to dispose the parts and what formulas they are to use on passing from one to another; pronounce a theme to them in English and Latin, and let them strive who can soonest return you the best *Exordium* in English, and then you can render it into the best Latin, and so you may proceed to the Narration, and quite through every part of a Theme, not tying them to the work of any author, but giving them liberty to contract or enlarge or alter them as they please." This they are to bring as a written exercise, and *to be able to pronounce it distinctly memoriter* at an appointed time.

After a study of passages from classical oratorical writings by the competition of boy against boy, exercises were thus brought to " the best," and also delivered orally in the most elocutionary style. Hoole states that this method made his boys " like so many nightingales to contend who could· μάλιστα λιγέως, most melodiously, tune his voice and form his style to pronounce and imitate classical orations." No day in the week was to pass on which some declamation, oration, or theme should not be pronounced by some boy in the sixth form. Schools which could not proceed to such effective results in the compositions of the boys themselves were contented to have their declamations from passages selected for the purpose from the classical authors. But in all cases, the intention originally was to practice the pupils in correct and fluent pronunciation of the classical languages, to improve the control of the knowledge of those languages for speaking purposes. The declamation was sufficiently important to find a place in school statutes and orders as a prescribed method. Thus the orders of Guildford grammar school, 1608, require that boys should declaim on grammatical or rhetorical questions on half holidays or Saints' Days. In Archbishop Laud's (1621–1628) transcript of the old orders of Westminster School declamations in Greek and Latin were prescribed for Saturdays. At Newport grammar school (Salop) (1656) the statutes ordain declamations once in six weeks, or in two months at the furthest on Saturday forenoon. So, too, at Wigan in 1664. An interesting practice prevailed in the Charterhouse and some other schools of sending the boys, on special occasions, to hear the exercises of the boys in famous schools such as Westminster or Merchant Taylors' School.

When the French influence came into England from 1660 onward, and French gradually took the place of Latin as the international spoken language, the declamation of the classics became less and less a regular daily or even weekly exercise, and the learning of so many Latin or Greek lines by heart to be recited in class was substituted. Still the declamation was retained for special occasions of the school, such as prize distributions, when the scholars recited before the governors, parents, and visitors chosen passages from the Latin and Greek authors, but intermixed with passages from the vernacular authors and authors who had written in the modern languages. This practice is continued in English Grammar Schools, and such occasions are still described as " Declamation Days."

F. W.

United States. — In American schools the late eighteenth century and the early nineteenth gave renewed emphasis to the importance of declamation through the increased opportunity for the public oration and the numerous occasions for display of oratorical power. The textbooks in reading and literature, as well as even those in spelling and grammar, became filled with selections suitable for declamation. This replacing of the old reading materials, chiefly of a religious character, by those of a political, social, or dramatic character, had great influence on the interests and the character of the people. Reading and such literary studies as found a place in the schools came to be used chiefly to develop this power of public presentation, rather than to develop literary appreciation, or power to use the English language effectively in conversation, speech, or composition. It was customary, in most schools, to set aside one afternoon a week, or at least one afternoon a month, for a general assembly to be devoted entirely to declamation. These exercises seem to have had a marked effect upon the public speaking of the period, but an effect that hardly meets with modern approval. In general the selections were beyond the comprehension of the pupils or of but little interest to them. They were usually martial verses on the order of *Bernardo del Carpio* and *Horatius at the Bridge*, or the fervid perorations of an impassioned oration, such as Patrick Henry's *Appeal to Arms*. Furthermore, these declamations were mechanically delivered in imitation of the pattern set by the teacher, and unlucky was the pupil who misplaced a gesture or failed to inflect his voice in the exact manner which his model indicated. The style developed, not only in the pupils, but in adult speakers, was bombastic and flamboyant — the style that even now appeals to the untutored as the very acme of oratorical perfection. When we hear it said that oratory or declamation is now on the decline, we must surmise that the reference is to this kind of oratory — the spread-eagle, star-reaching pyrotechnics of our forefathers.

But declamation and oratory in the truest sense are not declining, but rather developing; more refined standards are replacing the coarse ones of half a century ago, and sounder pedagogical principles are followed in the use of declamations in the schools and in the methods employed in teaching them. In the primary grades, more time is given to English than to any other subject, and also the child's power of free, oral expression is developed as the foundation for all effective work in reading and composition. In company with conversation lessons, language instruction, reproduction of stories, and dramatization, the memory or primary declamation helps to develop this general power of effective oral delivery. The subject matter of these memory selections (see New York *City Course of Study*) are within the child's comprehension, are of interest to him in their subject matter, and have a distinct literary excellence calculated to develop taste. The purpose of classroom and assembly recitation of these selections is not only to secure confidence before an audience, but to give a power of literary appreciation and a consequent ability to render the thoughts of the author in a sympathetic manner. The teacher also makes use of the declamations as a basis for the correction of defects in pronunciation and articulation. As a rule, very little is done in the matter of voice training and technical elocution. In teaching these selections, the methods generally adopted are calculated to increase the child's knowledge of words, impress him with a love for the beautiful in literary composition, and develop his general power of correct and pleasing oral expression, rather than to prepare him definitely for public speaking. But as the work progresses, this function of the declamation as a training in general language excellence gives way to a more distinctly oratorical or elocutionary purpose. The declamation is used more and more as a convenient means of having a pupil speak in public at a time when he cannot be expected to say something original.

It is in the secondary schools that the separation of elocution from the general training in English becomes clearly noticeable. In many city high schools and private academies the work of elocution is in the hands of a specialist, and is not regarded as a by-product of the department of English language and literature. The differences between the structure of matter meant to be spoken and that designed to be read are pointed out, and the pupil is trained to have a definite attitude toward the audience. In the treatment of declamation, the method is distinctly modern. Whereas a few decades ago the pupil was carefully coached to imitate his master's way of rendering a selection, the plan now is to stimulate rather the pupil's self-activity and to expect a spontaneous rendition of the declamation, prompted by the pupil's own thoughts and feelings. It is customary for the pupil to analyze the piece carefully for its meaning and to give the teacher either an oral or written paraphrase as evidence of the thought he gets from the author. The teacher guides, suggests, and keeps up the interest, but seldom recites any passage, for he is seeking not to impose his own personality and mode of expression upon the pupil, but to bring out a sympathetic rendition of an intelligent, first-hand interpretation. The pupil is made to realize that he must faithfully represent to an audience, by his voice and gestures, the thoughts of another. He owes a duty to the author and to his hearers. The selection is a living message to be conveyed to others, not a " piece " to be memorized and mechanically ground out in close imitation of the teacher. During the practice with declamations, instruction is usually given in the elementary principles of elocution, orthoepy, and voice management; and practical efforts are made to correct defects of delivery ranging all the way from stammering and stuttering, through nasality and dialect, to mere localism and mispronunciation. In some schools where debate (*q.v.*) and extemporaneous speaking are taken up, the declamation is regarded as a preparation for these more original forms of public speaking.

In college the declamation is used either in the lower classes as a preparation for the public speaking proper that is taken up in the higher grades, or it is developed independently to a marked degree along lines of advanced elocution. When used as a preliminary step in the general course in public speaking, the method of instruction is similar to that just described for the high school, save that the standard is higher. More attention is paid to the " straight speech " than to any other kind of selection, and the student is especially stimulated to acquire the speaker's attitude. When declamation is practiced as an end in itself, that is, for the purpose of training the student to become an interpretative public reader, the range of selections is widened and more systematically studied, while greater care is taken with the minutiæ of vocal technique. This, however, is the beginning of special, professional training.

E. P.

See DEBATING (References).

DECORATION OF SCHOOLS. — One common fault in the decoration of schoolrooms is overdecoration. A large number of charts, drawings, or illustrative material displayed at one time is not only distasteful and confusing, but introduces a distraction directly opposed to that sense of fitness and quiet beauty essential in genuine æsthetic appreciation. The first principle to be observed, then, is the following. A few good pictures or other objects of artistic excellence properly and appropriately placed exert a stronger and a more satisfying influence than a large number, even though when taken separately no objection could be found to any single piece. It is more than difficult to create and preserve a sense of artistic unity where many objects are presented to the senses, even though a similarity is distinctly noticeable. A few masterpieces teach effectively, while a great number distract; if great variety is presented, the multiplicity will effectively nullify any possible unity of thought or feeling. The second principle to consider carefully may be stated thus: The artistic decoration of schoolrooms should be planned with a full appreciation of the feelings and the power of emotional understanding of the children who are to occupy them. Here as in intellectual matters it is easy for adults to believe that what seems best to them will be most helpful to the children. True beauty and genuine art may be simply and plainly set forth, or hidden and only suggested. Children appreciate the former; thoughtful and discriminating minds much prefer and more keenly relish the latter. A child will appreciate and understand the "Melon Eaters" of Murillo, and get little or nothing from any one of his "Annunciations." A boy of the fourth or fifth grade will feel the spirit of "Sir Galahad," and get far more from it than from a "St. Anthony of Padua with the Holy Child." The emotional life of children demands wholesome and worthy stimuli, but also those which represent situations within their power to appreciate. To this end, it requires wise and judicious teachers, those who know what children can make use of as well as what they ought to have, to select pictures, and guide in all matters relating to schoolroom decoration.

In addition to the use of photographs, drawings, and statuary, it is to be hoped that the artists of our country will soon come to realize that public school buildings offer an unusual opportunity for mural painting both for the sake of decoration and that higher educational influence which comes from allegorical and historical representations. In this respect we are woefully behind many other countries. But surely it is neither because of lack of material, nor because of our ability to pay for such work that makes us neglectful in this part of our educational duty. There is a need of more artists and a more general appreciation of what art means to a nation. Here, then, where children live, and where the enthusiasms of life are awakened, is the best place to begin. Assembly rooms, well-lighted halls, and those special rooms set apart for drawing and art work in general ought to appeal particularly to those artists who know what our children need, and what our people ought to have. But there is yet a great deal to be done in the way of sincerity and honesty in the mere construction, furnishing, and finishing of our school buildings. Most architects are still satisfied with the merely usable, and these give little time or thought to exaltation of the common things by a touch of beauty. Our country is in great need of that ennobling impulse which seeks to make necessary things beautiful and satisfying. School desks, tables, chairs, and all other furnishings, even though inexpensive, deserve artistic treatment. In addition to the positive treatment of schoolrooms, the teacher can help very much by the skillful display of maps when needed, and their immediate removal when not needed. The location of desks, tables, bookshelves, and reference books deserves careful consideration. Blackboards are hard to keep clean in the upper grades of schools, but if shades, which will harmonize with the walls, are so placed that they can be drawn over the work until the board is further needed, a good deal of relief can be botained. It is a safe procedure in any community to select a committee of the most helpful teachers to submit plans for schoolroom decoration, for the principles of art and the capabilities and needs of the children are both at stake. It is then the duty of the supervisory officers to adopt, supply, and above all to keep an eye out for general fitness in all things. F. B. D.

For references and further discussion see the various articles on ART and ARCHITECTURE, SCHOOL.

DECUSSATION. — See NERVOUS SYSTEM.

DEDUCTION. — The process of reasoning (or mediate knowledge) by which demonstrated (in the sense of necessary) conclusions are arrived at from general principles which are themselves regarded as axiomatic (self-evident) or as themselves substantiated as necessary deductions from other self-evident principles. In the Aristotelian and classic sense, deduction was used more widely than the above definition indicates, to cover all processes by which necessary conclusions were reached. As the modern rationalistic movement limited necessity to *a priori* general concepts and judgments and what followed from them, the tendency was to restrict deduction to mathematical and syllogistic inference. Deduction is also used commonly in a looser sense to denote any reflective movement which applies general notions and principles to the determination of particular cases — for any logical movement that proceeds from the more to the less general, or from the concept of a system, or logical whole, to the specification of its members or parts. Psychologically, the tendency is to identify it with or at least to assimilate it to the use of habit as a principle of an organizing and mastering what would otherwise be isolated detail. This looser sense is the more fruitful sense for education. J. D.

See ANALYSIS AND SYNTHESIS; INDUCTION; METHOD.

DEDUCTIVE LESSON. — See LESSONS, TYPES OF.

DEFECTIVES. — A term used frequently, but with little uniformity, in educational discussions. Properly, it includes all children subnormal physically, mentally or morally; popularly, it designates those which deviate from the normal in a marked degree. Past usage has limited its application to those who are so markedly defective as to be feeble-minded. In the following article on SCHOOLS FOR DEFECTIVES, this usage is followed. Recently, however, further investigation has brought to light many other groups of children deviating from the normal and deserving special attention in school administration. These various classifications both of the supernormal and of the subnormal are given under the title, EXCEPTIONAL CHILDREN, EDUCATION OF, and the concrete discussion of the school work done is given under the appropriate topics, such as DEAF, EDUCATION OF; DEAF-BLIND, EDUCATION OF; BLIND, EDUCATION OF; BACKWARD PUPILS; IMMIGRATION AND EDUCATION; CRIPPLED CHILDREN, EDUCATION OF; NERVOUS CHILDREN, EDUCATION OF; TRUANCY; OUTDOOR SCHOOLS; RETARDATION AND ELIMINATION; SPECIAL CLASSES; etc. Somewhat inaccurately recent usage has tended to confine the application of the term " atypical " to that class of the subnormal on the border line and above the so-called defective or feeble-minded. The terms " ungraded " or " special classes " (*qq.v.*) are frequently used with this connotation, but this usage varies widely.

For fuller treatment of the usage of this entire group of terms, see EXCEPTIONAL CHILDREN, EDUCATION OF; and for the schoolroom treatment of these groups, see SPECIAL CLASSES.

DEFECTIVES, SCHOOLS FOR. — The history of schools for defectives is short but interesting. The law of the survival of the fittest has prevailed even among human beings until almost within the memory of our fathers. In ancient times defectives, both mental and physical, were allowed to die or were destroyed, sometimes even being given over to be devoured by dogs. It is an interesting fact that it was a being physically and mentally defective that first aroused human sympathy, and that it was his physical troubles that made the strongest appeal. In the latter part of the sixteenth century Professor Felix Platter of Basel called attention to the pitiable condition of the cretins (*q.v.*) in these words: " Mis-shapen bodies, deformed heads, swollen tongues, almost entirely without the power of speech, staring on the ground, with darkened countenance, the object of curiosity and scorn." In 1811 a census, ordered by Napoleon, showed more han 3000 cretins in Canton Wallis, Switzerland. In 1816, the first school was founded in Hallein near Salzburg by Gotthard Guggenmoos. This school for cretins was the first school ever started for defectives. Vincent de Paul and others had made some attempt to instruct and improve idiot children, but without success. This Salzburg school was closed in 1835 for want of money. A few idiots were successfully trained in the asylum for the deaf and dumb at Hartford, Conn., about 1820, but the work was not continued.

The first impulse toward the study of the feeble-minded was given by the experience of the famous Itard in his work with the "Savage of Aveyron," who turned out to be not merely an untutored savage, but an idiot. Itard worked four years (1801-1805) with this savage. In 1828 Ferrus began at the Bicêtre his study of the idiots. The real history of schools for defectives begins with Itard's pupil, Dr. Édouard Seguin, "The Apostle of the Idiot" The year 1837, when Seguin began his work, marks the real beginning of systematic rational training of mental defectives, which has gone on without interruption from that day to this. In 1844 a commission of the Academy of Sciences of Paris reported, after a most careful examination of Seguin's methods, that previous to the beginning of his work in 1837, idiots could not be educated or cured by any means previously known or practiced, but that he had solved the problem. As so often happens, in the first flush of a new discovery greater hopes are indulged in than can ever be realized. But to this false belief that idiots could be cured was undoubtedly due much of the activity that soon appeared, and perhaps no small part of our present equipment, though the error was soon discovered. Thus advertised, Seguin's work attracted many visitors both at home and abroad.

The first institution for idiots had been established in Germany in 1835 — for their care, not for their education. In 1841 another institution for cretins was founded by the famous Dr. Guggenbuhl on the Abendberg near Interlaken. Guggenbuhl had the same mistaken idea that he could cure the cretins by getting them up where there was good air and giving them good food and exercise. His institution lasted twenty years, and was then closed. Out of the inspiration from Guggenbuhl's work was founded an institution in Bath, England, and one in Baldovan, near Dundee, Scotland. Among those inspired by Dr. Seguin and his school for idiots at Bicêtre was Dr. Samuel G. Howe of the Blind Asylum at South Boston. He was so much impressed that in 1848 he started a class for the training of idiots. This led to the founding of the Massachusetts School for Idiotic and Feeble-minded Youth in 1851. New York established an institution about the same time. There had also been started a private school at Barre, Mass., shortly before this.

All of these institutions owe much to Dr. Seguin, who had come to America in 1850 on account of the political situation in France. He did much personal work for the training of defectives in all these early American institutions. Seguin's work was epoch-making. He himself called it the physiological method. It might just as well be called the psychological method, except that in his day that kind of psychology was unknown, but he proceeded to analyze the situation, and concluded that in a being where the nervous system and brain was undeveloped or was badly developed, the first important thing to do was to appeal to that brain through the sense organs by special methods. He accordingly devised elaborate systems of training the hand and the senses of taste and smell, and the eye and ear. For example, he says (*Idiocy and its Treatment by the Physiological Method*, p. 68): "Our instruments of teaching must be those that go directly to the point. In view of that necessity we must use object pictures, photographs, cards, patterns, figures, wax, clay, scissors, compasses, glasses, pencils, colors, even books." By such methods and individual treatment, he accomplished little short of miracles in the training of idiotic and imbecile children. It ought to be said in passing that his methods have probably had even more influence upon the training of normal children than upon idiots. His book (cited above) is a classic to be read by every student of pedagogy. For the teachers of the feeble-minded it was almost the sole authority for forty years. Even yet it is the first book to be read by any student of the subject.

In the next quarter century there were seven state and two private institutions established. One of the private schools was founded by Seguin himself, and is still maintained at Orange, N.J., by Dr. Seguin's widow. During the last thirty years institutions have multiplied until there are now thirty-four state institutions in twenty-six states. There are also about the same number of private institutions. The state institutions are located as follows: Maine, Rhode Island, Massachusetts (2), New Hampshire, Connecticut, New York (5), New Jersey (2), Pennsylvania (3), Maryland, West Virginia, Kentucky, Ohio, Indiana, Illinois, Michigan, Wisconsin, Minnesota, Missouri, Iowa, North Dakota, South Dakota, Kansas, Nebraska, Montana, Washington, and California. There are approximately 16,000 feeble-minded persons in these state institutions. About 800 more are being cared for in the private institutions. On the very conservative estimate that there are two feeble-minded persons in every thousand of the population, there are in the United States 180,000 such persons. It is thus seen that less than one tenth of them are being cared for. The rest are at large, mainly a burden upon the community. Nearly all of the institutions have large waiting lists of children who cannot be admitted because there is not room. The per capita cost in state institutions varies from $122 to $250, according to the location of the institution and other more or less favorable conditions. The private institutions are mostly owned and managed by private individuals, and are supported by the fees. From $600 to $1200 a year is the usual charge for a child. Nearly all of these institutions maintain school departments in which training is done more or less on public school lines.

As said above, Dr. Seguin was the first to put the education of the idiot on a scientific basis. Since this time changes have taken place along two lines. First it was discovered that without Seguin's small groups and individual instruction, which was impracticable in large state institutions, Seguin's results were not attainable. This led to the abandonment to a large extent of the efforts at training. Part of the difficulty was undoubtedly due to a failure to follow Seguin's methods, part to the attempt to do intellectual school work. On the other hand, there has been a tendency to take into the institutions a type of child of higher grade than Seguin worked with, and one whose very appearance tempted strongly toward a higher grade of intellectual training. This procedure was further stimulated by the fact that the mental defective often has an excellent memory, and consequently as long as his training was tested by the question and answer method he could make a good showing and give back what had been taught him with a very gratifying accuracy. In consequence, the school departments have in these later years become very prominent. That the feeble-minded child can be trained is a fact now rather generally accepted and acted upon. There are those, however, who maintain that the training can only be successful along industrial lines.

There are then three types of schools in the institutions. First, there are those whose ideal is "as near like a public school as possible." These have their kindergarden, first primary, second primary, and so on, usually to about the third or fourth grade of public school work. The three R's come in for full recognition, and besides these geography and history are given some attention, together with more or less manual training. The second type comprises those schools where manual training is given the chief emphasis and the three R's take a secondary place. These schools have extensive shops, and devote probably half the time to woodwork, basketry, knitting, sewing, domestic science, etc. The other half of the time is devoted to reading and writing, with some number work, though it does not go as far as in the other group. Nor do these schools attempt to train all the children, including the lowest grades of defectives, in these lines. Lastly, there is the group, small as yet, but apparently growing, which maintains that the intellectual work is practically useless to all but a negligible minority of mental defectives, and should therefore be discarded. It is maintained that the apparent results obtained by those who teach these things are mostly only apparent, the child simply being able to repeat what has been taught him without understanding it; and when not simply apparent have been obtained at too great an expenditure of time and energy or the great waste of the child's opportunity and good disposition. This is the theory, but it has not fully enough developed in practice in any institution. Those who hold the view lay great stress upon manual and industrial training, and accomplish great results along these lines. The children are happy, and develop into more or less useful workers at some occupation; but these same schools still teach reading, writing, and numbers to some extent, mainly because parents, and even the larger public, demand it. Which of these three views with their corresponding practices is right it is perhaps too soon to say. Yet certain facts are agreed upon. Feeble-mindedness is very largely an inherited condition, or at least the result of inherited weakness. A feeble-minded person can never compete successfully in the struggle for existence. Even the border line cases that are trained and sent out into the world barely eke out an existence when conditions are most favorable. In "hard times" they are invariably thrown out of employment, and often end up in the almshouse — sometimes the jail. With these children the power of conceptual thinking is almost entirely lacking. They must have the concrete, and even then it must be very simple and oft repeated. Abstractions are practically impossible. Attention is almost wholly of the involuntary kind. Will power and self-control are hardly capable of development.

The sixty years of effort in educating the defectives has never shown that the "intellectual studies" developed their minds at all. On the other hand, many that have had this training have proved, later, to be less useful than others of the same grade who have been trained only along manual lines. At best they never progress at more than half the rate of normal children. They seldom develop at all after twenty years of age. It is a rare thing to find one of whatever age who has a greater intellectual attainment than a normal child of eleven, and there are probably none intellectually over twelve. Left to themselves, almost none of them would ask to be taught to read or write or count. But they do ask to do manual training, and will work patiently and contentedly at it. The crucial test, however, is: what sort of lives are these children going to live? What kind of education will be of most use to them? This question again depends for its answer, upon what society decides as to its responsibility for these children. If, as seems likely, this condition is transmissible, then society ought to control the situation by keeping these children in institutions for life. Practically all persons in care of these children are agreed that this is the proper thing to be done. If that is done, then the question is rather easily answered. They have no need for reading and writing, because they can be made more useful and much more happy by other means. But even if they cannot be kept in the institution, do they then need to be taught reading and writing? In answering this two things must be considered: first, the great difficulty they have in learning, and second, the fact that the little they will ever be able to learn will at best be of very little use to them and at the worst serves in some instances to get them into trouble of one sort or another. Perhaps it is better to keep them in ignorance than to give them knowledge without moral control — which they cannot learn.

Even more vital is this question when it comes to the special classes in the public schools. (See SPECIAL CLASSES.) In 1903 the New Jersey Training School for Feeble-minded Girls and Boys opened a summer school for training the teachers of feeble-minded children. This was the first attempt to give formal training to those who were intending to teach subnormal children. Previous to that, each institution had either secured teachers from the public schools or had trained up its own teachers, ofttimes promoting attendants or others who have shown special ability with such children. Since that time the work has grown both at Vineland and elsewhere. In the former place the school is still maintained, and teachers come from all parts of the United States to take the course. It is still the only place where teachers can have a course with a model school of feeble-minded children, where they can observe and practice. Many universities, however, have put in courses on defective children, among the rest, Columbia, New York University, Chicago, the University of Pennsylvania, and the University of Washington. Some normal schools have begun to give a little attention to the subject, and in Massachusetts all the state normal schools are required to give some instruction in the training of backward and defective children.

In turning from conditions in America to England a similar state of affairs is found. London has one large institution at Darenth, managed by the Metropolitan Asylums Board. This has 2000 children. Their education is almost all manual training, which leads them directly into the shops, where they work happily at their "trade" all their lives. There are five large institutions of a semi-private character. They are general institutions for all classes of congenital defect, and are both educational and custodial. They are managed by boards of management appointed by the subscribers. Though they admit applicants from all parts of England, they are chiefly interested in particular groups of counties from which they receive some public aid. The object of the institution is best understood from the following quotation from their regulations. "That the design of this charity be, not merely to take the idiot and imbecile under its care, but especially, by the skillful and earnest application of the best means in his education, to improve his bodily powers, and prepare him, as far as possible, for the duties and enjoyments of life." There are, also, five institutions in the country, the Earlswood Asylum at Red Hill, Surrey, the Asylum for the Midland Counties at Knowle, the Royal Albert Asylum for the Northern Counties at Lancaster, the Asylum for the Eastern Counties at Colchester, and the Western Counties Asylum at Starcross. There are also two large private establishments, one at Hampton Wick, the other Downside Lodge Asylum at Bath. There are also many private homes for the care and training of the defective children. As a rule the education in these institutions is rather strongly bookish, although some manual training work is interspersed. Great stress is laid on number work in the English institutions.

In France there are only a few institutions. The hospital for the insane at Bicêtre has a children's department where are the feeble-minded. There are also institutions at Vaucluse and Fondation Vallée — near Paris. These have much physical work after the idea of Seguin and later of Bourneville. There is also much manual training and some reading and writing.

Germany has 101 institutions, caring for about 20,000 inmates. Ten of these are state institutions. A few are city, but the most are private or church establishments. In these also the work varies. They have much manual-industrial work, but also a considerable amount of " intellectual " work. Speech training may be said to be their specialty, and great stress is laid upon it. These children leave the institutions at the age of sixteen, and go to their homes. Here the pastor or some other person is supposed to have an eye upon them, see that they get some sort of work, do not get into trouble, etc. Of course many of them marry, and in time their children come back to the institution to be trained.

This problem of the after-care of mental defectives has hardly begun to be attacked anywhere in the world. The foremost place is in certain states in America, where the law provides that a child once in an institution remains there for life. This is true in New Jersey, and practically the same thing in one or two of the states of the West. However, in most cases it is the same here as in England, Germany, and other European countries, that a child goes out when he is about sixteen years of age, if he is at all able to make a pretense even of caring for himself. This policy prevails for two reasons. In the first place, as soon as the child is trained to be partially self-supporting, or able to earn a little something to contribute to the family, the parents want him at home to help in the support. Secondly, the state authorities think that if a child is thus able to take care of himself the state should be relieved from the burden of his support. In England there are after-care committees who have some oversight over these cases after they have gone to their homes, and see that they do not do any harm or come to pauperism or criminal life. This, however, is only partially successful, and the sentiment is growing rapidly that the only safe thing for society to do is to provide for permanent custodial care of all such cases, including even the very high-grade children who pass ordinarily for normal, although, in the popular phraseology, " uneducated." It is being recognized that these cases are generally mentally defective and never able to fully provide for themselves honestly, the result being that they eventually become either paupers or criminals. It is estimated that 30 per cent of all juvenile criminals are feeble-minded. A large percentage of our paupers are feeble-minded, and a very large per cent of prostitutes.

The students of the problem are urging very strongly that it is vastly cheaper for the state to provide for these cases in institutions for the feeble-minded where they can be trained and made partially self-supporting under supervision, than it is to turn them out and then have to take care of them in almshouses and prisons after they have done their work of crime. The strongest support of this movement has come recently from the report of the Royal Commission in England which was appointed by King Edward to study the problem of the mental defective. They worked over the subject for four years, and then made an exhaustive report, comprising eight volumes of testimony with their deductions and recommendations. This work is a most important contribution to the problem of feeble-mindedness. They strongly recommend permanent custodial care for all cases. The following brief account must suffice for some of the other European countries. Hungary has one institution. As was pointed out, the cretins of Switzerland were the first of the defectives to attract attention. But Switzerland has not neglected her other defectives. She has thirty institutions, with 1178 inmates. Agitation is being carried on in Italy by Dr. De Sanctis and Professor Ferreri, but not much is yet done. A society of interested people maintain a day school in Rome, which Dr. De Sanctis directs. The Keller institutions in Denmark are famous, and are said to be very much up-to-date in their methods. Belgium also has an association for the propagation of the idea of care for the mental defectives. Brussels has several special classes, and Dr. De Croly of the university has a private school for feeble-minded children.

Nowhere has the training of all grades of mental defectives been carried to such an extent and on such practical lines as in America under the inspiration of Dr. Seguin. After many years of experience with mistakes and successes it may safely be said that the American ideal for the feeble-minded is care and training for all grades, such as shall raise them at least a little in the lower grades and in the upper grades make them very useful when working under the direction of intelligent persons; that they shall all and always be happy; that they shall be maintained preferably in institutions or colonies where they are protected from dangers and from their own incapacity; that those who cannot be brought into institutions shall be cared for in the public schools, taught trades, and guarded all the time either by their parents or by probation officers. The problem of education for them is first to make them happy, and second to make them as little a burden on society as possible in their own person, and in their posterity not at all — because there must be none. H. H. G.

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DEFERRED INSTINCT. — See Instinct.

DEFINING, THE METHOD OF. — One of the modes of giving meaning to new words in the teaching of spelling and reading to children, where reliance is placed upon the use of synonyms, and verbal description of the attributes, qualities, or relations of the word. As a method it is usually distinguished from the "contextual method," where dependence is placed upon repeated and varied usage of the word in familiar context, and from the "objective method" where objects or pictures are denoted in connection with the word used. The method of word analysis or etymological definition is included as one of the forms of the method of defining. H. S.

See Spelling, Teaching of.

DEFINITION. — Definition may be considered either as a product or as a process. The ordinary treatment of formal logic deals simply with the finished product. So viewed, the doctrine of definition has no significance for educational theory or practice, save as it formulates in a succinct and definite way one result of education which it is desirable to attain upon the intellectual side — the ideal goal or limiting term of that process of mental clarification and organization that constitutes definition as a process.

While, therefore, pedagogy is primarily concerned with the gradual development of definition as conceived in logical theory, the formal concept of definition serves as a point of departure for considering the nature of the processes which lead up to it. The technical notion is that definition is the statement of the intension (or meaning) of a term, this intension consisting of genus and specific difference. That is to say, only general terms (notions, concepts) can, strictly speaking, be defined. The general term defined is regarded as one division (branch or sort) of a still more general term, this division being technically known as a *species*. Definition then states the next more general class (*genus*) in which a species falls, and also sets forth the characteristic traits (*differentiæ*) which mark off the species in question from other species falling in the same class. If we say that a barn is a building used for housing farm animals, "barn" is the species, "building" the genus, "housing farm animals" the differentia which characterizes a barn in contrast with a dwelling house, factory, woodshed, and all other objects that fall within the genus "building." To say that "heat is a mode of motion" is a defective or inchoate definition, because it states only the genus in which heat falls, without giving the properties that determine a mode of motion to be heat instead of sound, etc. To say a triangle is something with three sides gives a differentia, and a genus (something), but is defective as a definition because it leaves out of account the *next* higher or broader class of which triangle is one species, namely, surface. Hence the three primary rules of definition: (1) A definition must give the *essential* traits of the term defined, *i.e.* its next higher class and its peculiar or differentiating properties. (2) The definition must be exactly equivalent to the *intension* of the term defined, *i.e.* it must *not* include traits not necessary to the meaning of what is defined, and it must give *all* the traits required to differentiate it from other species of the same genus. (3) The definition must be exactly applicable to the *extension* of the term defined, *i.e.* it must apply to every object to which the term applies and to no other objects. Other rules sometimes given — as that the definition must not contain the term defined, or be couched in obscure, negative, or figurative terms, must not be redundant, etc. — are derivatives, warning against certain common ways of violating the primary rules.

Even this brief exposition brings out clearly that the *process* of defining is identical in essence with the *logical* growth of knowledge consisting in a movement toward *generalization* on one side, and toward *distinction* (or differentiation) on the other. In other words, definition is not an isolated peculiar intellectual phenomenon, but expresses the law of the fundamental evolution of knowledge, logically considered. The problem of instruction, viewed from this standpoint, is to transform the "blooming, buzzing confusion" that marks the first stage of apprehension of *every* subject into a whole which is definite and also coherent or interconnected. The differentia indicates the progress made in the direction of the change of vague confusion into precision and clearness; the genus indicates the progress made in the recognition of general principles and orderly system.

These considerations enable us to understand both the reaction against the use of the method of definitions in textbooks and teaching, and also the truly necessary place of definitions The objection against methods which begin with definitions of the various concepts of a subject is that it puts the cart before the horse. Since the definition expresses the *outcome* of a growth of knowledge of some subject, definitions presented ready-made at the outset have no counterpart in the genuine knowledge experience of the pupil, and hence are purely verbal, a rigmarole of words. Moreover, in anticipating a gradual mental growth they do harm by arresting development, unless offered simply as provocatives or stimuli. When, however, the pedagogical reaction against definitions is carried so far as to ignore them entirely, the learning of the pupil is haphazard, and the items of his knowledge are liable to remain either vague or isolated. ¶ Every step forward in intellectual mastery of any subject must be accompanied by increased recognition of some general principle applicable to the subject binding its elements together, and by increased apprehension of exact and relevant detail. Just how far it is desirable at each forward step to put the mental clarification and differentiation into words is a matter for the tact of the teacher to decide in each given case. In general, however, the effort to put the mental result into proper verbal form is likely to stimulate the pupil to heightened activity, and to insure proper precipitation and organization of the prior experiences. The teacher must also bear in mind that progress in definition is gradual, and that each step simply represents a provisional formulation. J. D.

DEFINITION, IN METHOD. — One of the steps in the method of the recitation. The fourth stage, the step of " generalization," in the procedure of the " inductive development lesson "; sometimes termed " recapitulation." See RECITATION, METHOD OF.

DEGENERATION. — Degeneration is a pathological condition in which some tissue of the body or some organized form of activity is destroyed through disease or through some agency which interferes with normal life. Degeneration of nerve fibers which have been cut is of great importance in the study of the course followed by these nerve fibers. Degeneration of mental organizations constitutes a form of pathology which is discussed in the article on ABNORMAL and its related topics.

DEFIANCE COLLEGE AND SCHOOL OF THEOLOGY, DEFIANCE, OHIO. — Founded in 1884 as a coeducational institution maintaining academic, collegiate, educational, and technical departments. Students are admitted by certificate or examination; the admission requirements are about fifteen units. Degrees are given in arts, science, education, and theology. There are seventeen professors and eleven instructors and assistants on the faculty.

DEFOE, DANIEL. — English journalist and novelist, born in London, 1659 or 1660 — not 1661, as is generally stated; died in London, Apr. 26, 1731. He was the son of James Foe, a nonconformist butcher, his mother's maiden name being unknown. He seems to have been early set apart for the Presbyterian ministry, and at about fourteen he was sent to a dissenters' academy at Newington Green kept by the Rev. Charles Morton, who was afterwards first vice-president of Harvard College. This school appears to have been more modern in its aims and methods than most other contemporary academies. The classics and theology were not neglected, but Mr. Morton read his lectures in English and gave much attention to history and the theory of government, to geography and the natural sciences, and to the modern languages. Before he left school, about 1678, Defoe seems to have abandoned the idea of becoming a minister. Almost nothing is known of his life for the next five years. By 1683 he was established as a hose factor in Cornhill, and on the first of January, 1684, he married Mary Tuffley, who brought him several children and survived him. Shortly after, he took part in Monmouth's Rebellion, but fortunately escaped Jeffreys. Another comparatively blank period follows, during which he wrote a few tracts now lost and allied himself with the Whig supporters of William of Orange. His first definitely known publication is a satire in verse, of 1691. The next year he became a bankrupt for the sum of about £17,000, the causes of his failure not being fully known. Charges of dishonesty were brought against him later, but he appears to have striven successfully to pay off his creditors, and no severe judgment against him is warranted by the evidence accessible.

For some time after his failure he seems to have been composing his *Essay upon Projects*, which was not published until 1697. Probably the most important section of this interesting book is that entitled *Of Academies*, in which Defoe discussed the founding of an institution modeled on the French Academy, with a digression upon the English vice of swearing, proposed the establishment of a royal academy for military exercises, giving details as to studies, instructors, and the like, and finally brought in a project for an academy for women, averring that he accounted it "one of the most barbarous customs in the world" for a civilized and Christian country to " deny the advantages of learning to women." His academy for women was to be no nunnery, no secluded establishment like that proposed by Mary Astell (*q.v.*), but " should differ but little from public schools." Its inmates should be taught music, dancing, and the languages, particularly French and Italian, they should be specially instructed in " all the graces of speech and all the necessary art of conversation," and they should be " brought to read books, and especially history, and so to read as to make them understand the world, and be able to know and judge of things when they hear of them." But while outlining the sort of studies that seemed best adapted to their needs, " to such whose genius would lead them to it " he " would deny no sort of learning."

As a writer on education, Defoe was probably more influential through such manuals of family training as the two volumes of *The Family Instructor*, *The New Family Instructor*, and *Religious Courtship*, to say nothing of his numerous books of instruction for tradesmen and merchants, such as *The Complete English Tradesman* and *A Plan of the English Commerce*, than he was as a pioneer in the higher education of women; but it is in the latter capacity that he displays the best features of his genius. It would be unfair to minimize, however, his services as an apostle of a modern and practical education. Whether he was defending himself from the charge of illiteracy, often absurdly brought against him by his contemporaries, or writing essays in the newspapers, or composing in his old age a book on the train- of *The Compleat English Gentleman*, — not published until 1890, — he never tired of recommending the study of history and geography and the sciences and a special attention to speaking and writing the English tongue.

Before the close of 1700 he had published ten or more pamphlets dealing with the chief political and ecclesiastical questions of the hour, and he had made himself something of a leader among the Whigs. In January, 1701, he issued, in defense of William III, his best verse satire, *The True-Born Englishman*, which attained immense popularity and secured him the personal confidence of the King.

With the accession of Anne came a revival of the hopes of the High Church Tories and a reverse of fortunes for Defoe. In an evil moment he undertook an ironical reply to the invectives of the bigots against the dissenters. His brilliant *Shortest Way with the Dissenters* (December, 1702) was voted a libel; he went into hiding, and a reward was offered for his discovery. He was captured in May, 1703; was tried and found guilty, and was condemned to stand three times in the pillory, to pay a fine, and to be imprisoned. There is evidence that he was for some time greatly unnerved, but when he saw that his fate was sealed, he wrote his defiant *Hymn to the Pillory*, and when he underwent the public portion of his punishment, he found the crowd sympathetic instead of hostile. From this time on his moral nature seems to have been warped, and he guarded against future persecution by evasions and direct falsehoods with regard to the authorship of his writings. He remained in Newgate until November, 1703 — not until August, 1704, as is usually stated. He owed his release to Robert Harley, Secretary of State, who desired to use his talents as a journalist and political agent. In February, 1704, he began his newspaper, the *Review*, in which he discussed political, ecclesiastical, and commercial topics with a moderation and acumen unparalleled at the time. It came to an end in 1713, and it has the honor of having given hints to Addison and Steele. Meanwhile Defoe had rendered valuable services to Harley by traveling through the country as a sort of political spy. In the fall of 1706, he was sent to Edinburgh to help to smooth the way for the union between England and Scotland, and his letters, his tracts, and his *History of the Union* show that he deserves to rank high as a secret political agent. With the return of Harley to power in 1710 Defoe's pecuniary fortunes seem to have improved, partly through a pension, but his standing as a journalist and a man was greatly lowered. He protested his independence, but when he put his *Review* and his tracts at Harley's service in demanding peace with France, he was read out of the Whig ranks, and denounced with only too much truth, as a renegade and a mercenary. Yet there is no proof that he may not really have thought that the war had lasted long enough, and it is clear that in his courageous opposition to the Schism Bill, which threatened the privileges of the dissenters to educate their children, he was true to his former liberal principles. There is rather conclusive evidence, however, that by this time he had become adept in the practice of writing on both sides of a given question. Despite the protection of the Prime Minister, he was not entirely able to escape those terrors which the law then held over rash journalists. He was sincerely alarmed at the progress the Jacobite cause was making in England and Scotland, and he wrote in 1712–1713 several tracts against the Pretender. Some of these, such as his *Reasons against the Succession of the House of Hanover*, were plainly ironical, but his enemies declared that they were in reality the treasonable pleas purported in their titles, and they instituted legal proceedings against him. Defoe made matters worse by commenting in the *Review* upon the partisan conduct of the Chief Justice, and as a result he suffered a short imprisonment for contempt. He was released in order that he might edit *Mercator* in the interest of Bolingbroke's proposed treaty of commerce with France; and later in 1713, through his own shrewd scheming, he secured a sort of blanket pardon for his journalistic indiscretions.

The death of Queen Anne ushered in a still more discreditable period of Defoe's career. He was arrested for libeling the Earl of Anglesey, and was kept in grave suspense by the postponing of his trial. He seems to have lost the favor of Harley, then Earl of Oxford, by writing the three parts of *The Secret History of the White Staff*, in which damaging admissions were made with regard to Oxford's administration. He tried without success to rehabilitate himself in the public eye by writing his exceedingly plausible but misleading *Appeal to Hon-*

our and Justice (1715). Then he appears to have entered upon what can be described only as a debauch of pamphlet writing. Probably no one will ever be able to straighten out his bibliography for the single year 1715, which was also marked by the first part of *The Family Instructor* and by a *History of the Wars of Charles XII.* His contemporaries represented him as capable of writing two thick pamphlets a day on any subject, and the charge contains a measure of truth. Perhaps it was his services as a pamphleteer in the Hanoverian interest that induced Chief Justice Parker to lend an ear to Defoe's petitions and to omit to sentence him after he had been found guilty of the libel of the year before. We know at least that Parker introduced him to Lord Townshend, the Secretary of State, who employed him as a spy in the offices of the Jacobite newspapers.

His chief, but by no means his sole journalistic employments, during this period, were with *Mercurius Politicus*, *Mist's Journal*, and *Applebee's Journal.* The publisher of the last-named issued many of the confessions of the chief criminals, and thus Defoe was brought in contact with the low-class characters, whom he described in such stories as *Moll Flanders* and *Colonel Jacque.* Before he began writing fiction, however, he fairly outdid himself in disreputable journalism by low attacks upon Toland and Tindal, by rather ribald contributions to the Bangorian Controversy, and by forging — that seems to be the word — the *Minutes* of Mesnager, the agent Louis XIV had sent over to arrange the preliminaries of peace. Yet he found time in the midst of this more than questionable activity to add a second volume to *The Family Instructor* and to compile that exemplary book, *Memoirs of the Church of Scotland.*

At last, with April, 1719, the Defoe the world knows, the Defoe whom, if we choose, we may call the real Defoe, emerges with his great classic story, the first part of *Robinson Crusoe.* How he came to write it is still a mystery, although it is clear that for some years he had been developing his powers as a narrator and his remarkable equipment in point of knowledge for realistic description of life whether at home or abroad. His central theme, the shipwrecked sailor struggling successfully with the pitiless forces of nature, was sure, if adequately treated, to give his book universal appeal; but that theme had been handled before, and others before Defoe had attempted the narrative of adventure without achieving his success. If he had been a mere journalist, his book might have gone the way of its predecessors. But he was that unaccountable thing, a man of genius, and he produced a classic. Nor is *Robinson Crusoe* merely a literary classic. In the light of Rousseau's well-known opinion of its merits and of its wide use in the nursery and the schoolroom throughout the world, it is fairly to be called an educational classic as well.

Imagination is also to be seen to a greater or less degree in many members of the extraordinary series of works produced by Defoe between 1719 and 1727 — in the life of *Duncan Campbell*, in which he discusses the education of the deaf and dumb, in *Captain Singleton*, which illustrates his exceptional knowledge of the geography of Africa, in the *Memoirs of a Cavalier*, in *Moll Flanders*, *Colonel Jacque*, and *Roxana*, and above all, perhaps, in that tremendously impressive book, the *Journal of the Plague Year.* After about five years his gift of story-telling, which did not really display itself until he was nearly sixty, seems to have flagged, unless we agree to give him the interesting "memoirs" of Captain Carleton, of 1728, and the excellent *Adventures of Robert Drury* of 1729; but his energy as an author continued almost unabated until about two years before his death.

It is scarcely too much to say that in quantity, and one might almost add in quality and variety of production, Defoe is the most marvelous old man in the history of literature. Merely to enumerate the books and tracts of his old age would swell this article unduly, and it is scarcely likely that we shall ever know the full extent of his productions. It would be unjust to him, however, not to mention his timely sociological writings, the quaint series of books on occult subjects, tracts like *Mere Nature Delineated*, which display his interest in the education of the mentally deficient, and, last but not least, his valuable and entertaining *Tour through the Whole Island of Great Britain*, in three volumes, one of the least accessible of all his works, but full of information on an astounding variety of topics, including schools.

In the fall of 1729, when he was writing *The Compleat English Gentleman* and the monograph extracted from that, *Of Royal Education*, he was suddenly taken ill. Whatever the cause, we know that he was for a while in hiding, and that, when he died in April, 1731, the end came, not at his home, but in a lodging house away from his family. Unless illuminating documents are found, these last years of a life far from clearly known in other periods must remain perplexingly obscure. It seems unlikely, however, that, if his mind was clouded at all, it remained clouded to the end. There is strong bibliographical evidence that at the end of 1730 and the beginning of 1731 he was writing and publishing with an energy unusual in any man of over seventy, and almost unusual for Defoe himself.

To attempt to sum up such a character and career is a hopeless task. Although to a certain extent unprincipled, he was probably more sinned against than sinning, and he had many fine traits, chief of all his stanch zeal for civil and religious liberty. He was probably the most open-eyed and modern-minded man of his age. He was by all odds its greatest journalist, and perhaps in this capacity he has never been surpassed. He was a true and influential educator, not only in his specific writings on education, but in his numerous works of miscellaneous information. He was a fair historian for his day, and he was the first Englishman to write fiction which can be termed great. For whatever the defects of his novels in plot and characterization, they are great in their realistic holding power. Finally, he is the author of the most universally current classic of modern times.

The ablest work yet produced upon Defoe is Walter Wilson's *Memoirs* in three volumes, (1830). William Lee's *Life and Newly Discovered Writings* (3 vols., 1869) is valuable, especially for its bibliography of 254 items. See also the biographies by William Minto and Thomas Wright. The most complete edition of the works, which scarcely contains a tenth of them, is Tegg's of 1840–1841. The best modern edition of the *Romances and Narratives* is that prepared by Mr. George A. Aitken, whose contributions to Defoe's biography have been of great value. In a forthcoming life and bibliography the present writer hopes to supply a good deal of new biographical material and to extend very considerably the list of Defoe's writings, perhaps by a hundred titles. W. P. T.

DEFORMITY IN SCHOOL CHILDREN. — See ORTHOPEDIC INVESTIGATIONS AMONG SCHOOL CHILDREN; SPINAL CURVATURE; AND MORBIDITY.

DEGENERACY IN SCHOOL CHILDREN. — See CRIMINALITY AMONG SCHOOL CHILDREN; EDUCATION AND CRIME; NERVOUS DISEASES; MORBIDITY.

DEGREES. — The official recognition bestowed by a university that a certain step or grade has been attained in a branch of learning. Historically two elements entered into the granting of a degree corresponding with the early history of the university (*q.v.*). The members of the faculties consisting of the masters of the faculties, composed different guilds and held themselves responsible to demand certain requirements from those who wished to enter their body. After inquiring into the fitness, mental and moral, of the candidates, they presented them to the Chancellor (*q.v.*) representing the ecclesiastical authority for permission to incept or for the license to begin teaching. The candidates were then called *magistri, doctores, professores.* Thus the early university knew only one degree — the attainment of mastership. Originally the baccalaureate was not a university recognition at all. It denoted a stage or step toward the mastership, but was granted by the nations and the rectors of the nations after a ceremony corresponding to that for the mastership. The course for the young student who entered the university thus came to be as follows. He enrolled himself under a master with whom he began reading the prescribed texts in the Trivium (*q.v*). At the end of three or four years, when he could define and determine and could dispute with a master in grammar and logic, he was admitted to the examination before representatives of his own nation, and, if successful, became a bachelor, *i.e.* a recognized candidate for a mastership. He was now a pupil teacher and was permitted by his master to teach the younger students. In the course of time the baccalaureate became an inferior degree. So far this procedure prevailed at Paris. A candidate who wished to proceed to the degree of master or doctor — and not all did so — continued to attend lectures of other masters, had to dispute, and to hear all the books prescribed by the faculty. In addition he had to deliver some lectures himself.

The whole course from matriculation lasted about six years. At the end of this period, if the candidate had reached the age of twenty, he was examined by the Chancellor's board to see if he had met the requirements as to residence, reading, and exercises; if worthy, he took an examination set by his faculty, and could then present himself for the Chancellor's license. The examination at the license ceremonial was purely formal as early as the fourteenth century. The license gave the candidate the right, which he was expected to exercise, to incept within six months. The changes by which the B.A. was gradually eliminated in some universities and given a place of importance in others were slow. At Paris the tendency was to shorten the period between matriculation and the baccalaureate; in 1366 the minimum period for obtaining the master's license was four and one half years; soon after, this was shortened to three and one half years, and the practice grew up by which students came to Paris already with the baccalaureate standing from other universities. Eventually the baccalaureate and matriculation became synonymous. In Scotland the baccalaureate disappeared entirely. The English nation at Paris required the candidate for the baccalaureate to be at least nineteen and to have spent four or five years in the faculty of arts. When this practice was taken over at Oxford, the B.A. continued for a time to be the preliminary stage to the M.A., but as the schools improved and candidates came to the universities at the age of sixteen, it became more and more impossible to enforce the requirements of prolonged residence; hence the time was shortened in some cases, or actual residence was dispensed with and candidates could come up for their master's degree at the end of the statutory period. The latter practice prevailed at Cambridge when it was incorporated in the statutes in 1608.

For the higher faculties — theology, law, medicine — additional periods of study were added after the degree of master. Thus three years of study were required for the standing of bachelor in theology, and eight years for the degree of doctor in theology. In 1366 the complete course extended over sixteen years, and in 1452 over fifteen years. For the degree of Doctor of Civil Law at Cambridge ten years' study was necessary, although the arts course was not required as a preliminary. In medicine the arts degree was required, five years of study and two years of practice before the degree could be obtained. The titles of master, doctor, professor were originally synonymous; master, however, was more commonly employed in the faculties of theology, arts, and medicine at Paris; doctor, professor, and dominus were used at Bologna in the faculty of law; and doctor in connection with canon law at Paris. In the fifteenth century the title of doctor was gradually retained for the higher faculties, and master for the faculty of arts. In Germany the title of doctor spread to other faculties, and the one degree of Doctor of Philosophy was and has continued to be given in all faculties. In England the only instance where the doctor is only equivalent to the master is in the degree of Doctor of Music.

Present Position. — Except on the continent of Europe, the tendency has been to increase the number and titles of degrees. Germany gives only the doctorate in all faculties. In France the university degrees are the *licence* and the *doctorat* in the faculties of arts, sciences, theology, medicine, and law. The *baccalauréat* is prerequisite for all degrees, and in arts and sciences is obtained in the secondary schools. The *licence* may be obtained by examination after residence of one or two years. For the doctorate in arts and sciences, which can only be obtained on passing the twenty-fifth year, theses must be presented and defended. The degrees in theology are obtained by examinations, both written and oral. In the faculty of medicine neither the *baccalauréat* nor the *licence* are required for the doctorate, which can be obtained in a minimum period of four years, but usually requires longer. In the faculty of law the *baccalauréat* is incorporated with the *licence*, which is obtained at the end of three years' study, while two years more are required for the doctorate. All degrees in France are conferred by the State, and carry with them the privilege of practicing in the faculties in which they were obtained.

England has witnessed a rapid increase in the number of degrees within the last half century. Oxford and Cambridge have remained the most conservative, and have only added the scientific degrees. Oxford grants the B.A. at the end of four years' study and the necessary examinations in all but the superior faculties. The M.A. degree may be obtained by retaining one's name on the books of a college and paying the necessary fees five years after obtaining the bachelor's degree. The Litt.D. is given on presentation of evidence of literary or scientific work of importance. Other degrees are the Mus. Bac. and Mus. Doc., given on examinations without requirement of residence; B.C.L., only conferred on those holding the B.A., and D.C.L., granted on a dissertation; in medicine the degree of M.B., granted after a study of six or seven years, in the course of which the degree in arts must be taken; the M.D. is given on a dissertation with the M.B.; the degree in surgery (B.Ch.) is conferred *ipso facto* with the M.B. The degrees in theology (B.D. and D.D.) are only conferred on candidates who have obtained the M.A. and are in priests' orders. The degrees of B.Sc. and B.Litt. can also be conferred under certain circumstances. The degrees at Cambridge are similar, with the exception that the LL.B. and LL.D. take the place of the B.C.L. and D.C.L. and only three years' residence are required for the B.A.

In the more recently established universities the degrees are differentiated more according to the faculties. Thus all, including the Scotch universities, confer the B.Sc., first instituted by London in 1860; in the University of London this degree is given for pure science, engineering, economics, political science, including commerce and industry, agriculture, and veterinary science. The University of Liverpool gives a separate degree in engineering (B.Eng.); the universities of Manchester, Birmingham, and Leeds give the degree of B.Com. in commerce and B.Sc. Techn., and D.Sc. Techn. in the branches of technological science. The requirements of residence in these universities are in almost all cases three years for the first degree, except in medicine, which demands at least five. The masters' degrees are obtained usually three years after the bachelors'; and the doctorate after three more years. Nearly all the universities have two examinations and two courses for the bachelors' degrees — ordinary and honors. The ordinary courses are fairly general; the honors courses require more specialized study in a narrower field. Graduates in honors courses usually proceed to the M.A.; others must take a second examination. In the University of London all degrees, including the doctorate, are granted only on examination. For the doctorate (D.Litt., D.Sc., and in Birmingham University and Scotland, D.Phil.) evidence of literary or scientific research of value must be produced as a general rule. On the whole, however, a very small number of students proceed to the degree of doctor.

There are no separate degrees to be conferred *honoris causa*. As a general rule any of the doctorate degrees are granted in such cases. In some instances the masters' degrees are used for honorary conferment. It may be said that the majority of those in England who hold the degree of doctor, except in the faculty of medicine, received it as a mark of honor from the universities.

America. — The multiplication of degrees has been carried to an extreme in this country accompanying in extent the opportunities for specialization in the different studies. At the same time a large number of the degrees are worthless, given by institutions which by no means come up to college rank either from the point of equipment, staffing, curriculum, or requirements. The increase in the number of degrees is of recent growth, dating perhaps from the middle of the last century. The Ph.D. was first conferred in 1861. Since then forty-seven different degrees are conferred, according to the Report of the Commissioner of Education for 1907. No distinction is made between degrees obtained on examination and honorary degrees. This raises a question of considerable difficulty, for in addition to the practice of granting degrees on very low requirements, there also prevails the practice of conferring honorary degrees either for insufficient reasons or at a price. The result is that the holders of *bona fide* degrees from institutions of good standing are in danger of being classed with those whose degrees are worthless. A movement was begun some time ago to restrict certain degrees for honorary conferment. These are the L.H.D., S.T.D., D.D., LL.D., D.C.L., Mus. D.; these would tend to be distinguished from those degrees which are obtained by examination.

The most usual requirements for the bachelor degrees is a four years' course of study, accompanied by the necessary examination. In the larger institutions the master degrees are no longer conferred in course, but only after one year of specialization in a definite field, accompanied by examintion and a thesis in most cases. For the higher degrees of doctor two or three years' study and the presentation of an original piece of research work are required. Most faculties have the bachelor, master, and doctor degrees. Medicine alone has only the doctorate. There are also higher degrees in law, as the LL.M., D.C.L. (Yale), and J.D. (Chicago). In divinity there are only the bachelor and doctor degrees.

DEGREES		On Men	On Women
A.B.	(Bachelor of Arts)	5406	4540
B.S.	(Bachelor of Science)	4359	792
Ph.B.	(Bachelor of Philosophy	723	458
B.L.	(Bachelor of Letters)	141	412
B.M.E.	(Bachelor of Mechanical Engineering)	37	—
B.E.E.	(Bachelor of Electrical Engineering	10	—
B.E.	(Bachelor of Engineering)	75	2
B.Arch.	(Bachelor of Architecture)	8	—
B.Agri.	(Bachelor of Agriculture)	80	—
B.S.A.	(Bachelor of Scientific Agriculture)	21	5
B.Mus.	(Bachelor of Music)	11	81
B.Ped.	(Bachelor of Pedagogy)	34	79
B.F.A.	(Bachelor of Fine Arts)	1	—
B.C.S.	(Bachelor of Commercial Science)	2	1
B.Acc's.	(Bachelor of Accounts)	7	—
B.O.	(Bachelor of Oratory)	—	5
A.M.	(Master of Arts)	1226	405
M.S.	(Master of Science)	198	24
M.L.	(Master of Letters)	24	28
Ph.M.	(Master of Philosophy)	10	1
C.E.	(Civil Engineer)	445	—
M.E.	(Mechanical Engineer)	475	—
E.E.	(Electrical Engineer)	220	—
E.M.	(Engineer of Mines)	158	—
M.M.E.	(Master of Mechanical Engineering)	8	—
Met.E.	(Metallurgical Engineer)	16	—
M.Acc's.	(Master of Accounts)	8	—
M.F.	(Master of Forestry)	1	—
M.Arch.	(Master of Architecture)	2	—
Sc.D.	(Doctor of Science)	1	—
Ph.D.	(Doctor of Philosophy)	343	51
M.C.S.	(Master of Commercial Science)	9	—
M.C.E.	(Master of Civil Engineering)	3	—
M.E.E.	(Master of Electrical Engineering)	2	—
L.I.	(Licentiate of Instruction)	8	3
M.S.A.	(Master of Scientific Agriculture)	3	—
M.Dip.	(Master of Diplomacy)	1	—
M.Mus.	(Master of Music)	—	2
D.Mus.	(Doctor of Music)	—	1
A.A.	(Associate in Arts)	—	3

The accompanying is a representative list of degrees granted in this country, with the number of each kind conferred on men and women in 1907–1908. (From *Rep. Com. Ed.*, 1908, p. 615.)

In addition to these there are also granted the following degrees in medicine:—

C.M. (*Chirurgiæ Magister*), Master in Surgery;
D.M., Doctor of Medicine;
D.M.D. (*Dentariæ Medicinæ Doctor*), Doctor of Medical Dentistry;
D.V.M., Doctor of Veterinary Medicine;
V.S., Veterinary Surgeon.

In law the following degrees are found :—

B.LL. or LL.B. (*Legum Baccalaureus*), Bachelor of Laws;
D.C.L., Doctor of Civil Law;
J.D. (*Juris Doctor*), Doctor of Law;
J.U.D. (*Juris Utriusque Doctor*), Doctor of Civil and Canon Law;
LL.D., Doctor of Laws.

It is somewhat significant that in France only 100 doctor degrees were granted in 1909. With a life of thirty-five years for the degree, there will be in existence at any one time only 3500 French doctors. In that period there will be in the United States a supply of more than 18,000 in doctors alone. (See *Journal of Education*, London, March, 1910).

See College, American; Universities.

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See also University Calendars, Announcements, etc.

DEGREES, HONORARY. — See Degrees; Universities.

DELAWARE COLLEGE, NEWARK DEL. — Chartered in 1833 by the legislature of Delaware, opened in May of that year under name of Newark College, which was changed in 1843 to the present title. After the passing of the Morrill Act (*q.v.*) the government of the college was changed and a share was given to the state. (See DELAWARE, STATE OF.) As thus reorganized, the college was opened in the autumn of 1870. Subsequent appropriations by Congress, automatically increasing, will amount within the next five years to $41,000 annually, one fifth of which, however, goes to the college for colored students at Dover, Del. The state has also made liberal annual appropriations, varying from $10,000 to $25,000. In organization the institution is a college, with classical, scientific, agricultural, and engineering courses; there is also a two years' course in agriculture. The Delaware Experiment Station in Agriculture is a department of the college. Buildings and equipment are valued at $244,800. A farm of 217 acres was purchased for the college by the state in 1907, and supplies facilities for practical instruction in agriculture. The total annual income is about $43,000. The average salary of a professor is $1650. There are (1909) twenty-three members on the instructing staff. There were in 1910–1911 165 students.

C. G.

DELAWARE STATE COLLEGE FOR COLORED STUDENTS, DOVER, DEL. — Established under act of Congress of 1890 and under the act of the General Assembly of the state of Delaware on May 15, 1891. The latter act divides the money given by Congress between the Dover institution and the Delaware College at Newark. The college, which is coeducational, maintains courses in agriculture, mechanical arts, the subjects fundamental to these studies, and normal. Candidates are admitted on passing a satisfactory examination in common school subjects. Degrees are given in engineering, agriculture, and science. There is a faculty of ten members.

DELAWARE, STATE OF. — One of the thirteen original states, and the first to ratify the Federal Constitution in 1787. It belongs to the South Atlantic Division of states, and has a land area of 1960 square miles. Next to Rhode Island, it is the smallest state. Texas would make 136 states the size of Delaware. For administrative purposes the state is divided into three counties, and these, in turn, into school districts and incorporated places. In 1910 Delaware had a population of 202,322.

Educational History. — The work of the Swedes, Dutch, English, and the different religious societies did much toward local education in the early history of the Delaware colony, but the first legislation dates from 1744, when an act of the Assembly ratified all conveyances of lands or houses previously made for educational purposes. The first act involving any grant was made in 1772, when a lot of land in New Castle was granted for a school. The first constitution of the state, adopted in 1776, made no mention of education. In the constitution of 1792 a short section was inserted to the effect that " the Legislature shall, as soon as conveniently may be, provide by law for establishing schools, and promoting arts and sciences." This section was reproduced in the constitution of 1831, and remained unchanged until the adoption of the new constitution in 1897. In 1796 the beginnings of the school fund were made, when it was ordered that the income from marriage and tavern licenses should be appropriated to such a fund. This accumulated until 1817, when the income was used for the first time, $1000 being appropriated to each county for the instruction of the children of the poor in reading, writing, and arithmetic. In 1821 aid was given to Sunday schools, and $1 per quarter per child was given to teachers who taught pauper children in day schools. By 1829 the school fund amounted to $151,643.42, and the annual income to $9,255.50 and in this year, the first free school law was adopted. This law laid down the main outlines of the school system which has since prevailed. School commissioners were appointed for each county, who were to lay the county off into school districts; county superintendents were to be appointed by the Governor; an annual school meeting was to be held; provision was to be made, by subscription or voluntary contribution, for the support of a free school in the district; and each district was to receive from the state fund a sum equal to that so raised, but limited (in 1830) to $300 per district. The public schools of Wilmington date from this time. By 1833, 133 districts had been organized. The fund was now insufficient, and a decline in the schools set in, due to the unwillingness of the people to tax themselves further. In 1835 $25,000 was raised for the school fund by a lottery; and in 1837 the surplus revenue was distributed equally to the counties to be used for school purposes, and the requirement of district taxation was reduced to $25, to share in the school fund. In 1843 the first state educational convention met, and this convention put itself on record as opposed to compulsory school taxation. By the law of 1852 the schools of Wilmington were reorganized and given an independence which they have since maintained. Nothing further was accomplished until 1861, when a law was passed, raising the required tax to be voted to $75 in New Castle County, to $100 in Kent County, and to $30 in Sussex County, and authorizing further district taxes up to $400 for maintenance, and up to $500 for buildings. This law made taxation and a school in the district compulsory instead of optional with the voters, and marked a great advance.

A law of 1875 provided for the appointment by the Governor of the first State Superintendent; for an *ex officio* State Board of Education, whose duties were prescribed; for the first certificates for teachers, to be issued by the State Superintendent; and raised the required district tax to $60 for Sussex County, and to $100 for Kent and New Castle. In 1875 the first teachers' institute was held, and after 1883 state aid of $100 per county was given for them. In 1881 the State Superintendent was authorized to purchase all the school books needed in the state and to sell them to the districts at actual cost. In 1887 a new school law was enacted, which abolished the office of State Superintendent; reëstablished the county superintendency; definitely provided for county teachers' certificates; stopped the state purchase of textbooks; reconstituted the State Board of Education, and gave it power to adopt textbooks for use in the schools of the state. In 1891 free textbooks were provided for all public school pupils. Between 1875 and 1881 what colored schools existed were supported entirely by the colored people. In 1881 the first state appropriation ($2400) was made for colored schools. This was gradually increased to $9000 in 1891, and in 1898 colored school districts were ordered to be laid out in each county, and were placed on the same basis for state aid as white districts.

In 1897 a new state constitution was adopted, and in this definite provision for education was made for the first time in the history of the state. The General Assembly was directed to establish and maintain "a general and efficient system of free public schools," and was given power to enact a compulsory education law. It was also directed to appropriate not less than $100,000 annually, to be added to the income from the Public School Fund, which was to be apportioned equitably among the school districts of the state for teachers' salaries and free textbooks only, and no distinction on account of race or color was to be allowed in making the apportionment. Separate schools for the two races were provided for; aid to sectarian or denominational schools was forbidden; all school property was exempted from taxation; and taxation for education was authorized. Under the authority of these new constitutional provisions, the school law was revised in 1898, though most of the features of the old law were retained. In 1899 state aid for the tuition of pupils in graded schools was provided for. In 1901 the apportionment law was revised and made more equitable, and the local tax requirements raised. In 1903 $1000 per county was granted to help to pay the tuition of pupils in normal schools designated by the county school commissioners, and $6000 a year for two years to aid in building and repairing colored-district schoolhouses. In 1907 the compulsory education law authorized by the Constitution was enacted; and school districts were now allowed to borrow money by bonds or mortgage to build or repair school buildings.

Present School System. — The school system of Delaware, as at present organized, is as follows: At the head is an *ex officio* State Board of Education, consisting of the Governor, the Secretary of State, State Auditor, the president of Delaware College, and the senior member of each county school commission. County superintendents, though not actually members of the board, are required to attend each of its regular meetings. The State Auditor acts as secretary of the State Board, issues all reports, and virtually acts as State Superintendent. This State Board meets quarterly, and has general supervision of the schools of the state; adopts textbooks for the schools, and fixes the prices at which they are to be sold to the districts; compiles separate sets of examination questions for the examinations for teachers in white schools, colored schools, and graded schools; prepares all blanks used; hears and determines appeals; and reports to the General Assembly. In considering appeals of colored teachers or colored school committees, the president of the state college for colored students temporarily replaces the president of Delaware College on the board.

For each county, the Governor appoints three county school commissioners for three-year terms, not more than two to be of the same political party. This board has control of the schools of the county, subject to the supervision of the State Board. They hold quarterly meetings; make rules and regulations for the government of the schools of the county; investigate school work and school conditions in the county, including schools in incorporated towns, Wilmington excepted; oversee the work of the county superintendent, aid and advise him, and hear complaints against him or any teacher under him; may condemn school buildings, or order them to be repaired; and may change the lines of districts on petition. The Governor also appoints a county superintendent for each county, who has general supervision of the schools of the county. He attends the meetings of the State and County boards, and reports as to conditions; visits the schools; executes orders of the State Board; compiles statistics; conducts teachers' institutes and examinations, and issues teachers' certificates; and oversees the enforcement of the compulsory education law.

For each district, white or black, there is a school committee of three, elected by the voters of the district at the annual school election. The annual school meeting can decide on extra district taxes, and on the location of the school buildings. The district School Committee repairs the schoolhouses; buys supplies; employs and dismisses teachers; makes rules and regulations; collects and receives all taxes and apportionments, and expends the same; makes an annual report to the State Auditor, and to the district school meeting; and compiles an annual list of taxable property, by race, in the district. Provisions are made in the law for union school districts and for graded schools; for the condemnation of sites for schools; for the establishment of kindergartens, where desired; and for free textbooks for all the schools of the state, except those in the city of Wilmington. The State Board contracts for and pays for all textbooks, and the districts have the cost of the books ordered deducted from their state school fund apportionment. For the government of the city of Wilmington, and the nature and extent of its school system, see special article on WILMINGTON.

School Support. — The school fund, the origin of which has been described above, now amounts to about $350,000, and is slowly increasing in amount from various sources. The interest on this fund, together with an annual state appropriation of $132,000 (law of 1901), is apportioned equally to all the districts in the state, white and black, on the basis of the number of teachers actually employed for 140 days, with a limit of 165 teachers to any single district, and provided always that the district has raised, by local taxation, not less than $100, if white, and $50 if colored, for each teacher employed. By providing a room and raising the required tax before Aug. 20, advance apportionments for teachers may be received. Any unused state school fund remaining on hand, and all debts for textbooks bought of the state, are deducted in making the new apportionments. There is no county school tax, all other money needed for schools being raised by district taxation. As black districts are separate from white districts, and as the assessment and poll tax lists are also compiled separately, this means that each race maintains its own school system, except for the state aid which is given equally to all.

In expenditure for schools Delaware falls into the group of Southern states, the average expenditure per pupil per day being but 11.7 cents at the last report, which is lower than any Northern state. Only eight Southern states are lower, while the average of the North Atlantic group was 23.7 cents. In amount raised per child, five to eighteen years of age ($9.51) or in amount raised per adult male ($8.63), the state occupies about the same relative position.

Educational Conditions. — Of the population of 1900, 16.6 per cent were negroes, and 7.5 per cent foreign born. 41.4 per cent of the total population of the state is located in the one city of Wilmington, 5 per cent live in smaller incorporated places, and 53.6 per cent live in country districts. Averaged over the state as a whole, the state has much more wealth back of each child than have the Southern states, averaging practically the same as Pennsylvania, but the wealth is not evenly distributed, the northern part having much greater resources than the southern. Considering the resources of the state, the school term required (seven months) is long, and the average number of days attended by each pupil enrolled (116.6 days) is higher than any other state in the two Southern divisions, being about the same as the average for the North Central Division. In percentage of the colored population, five to eighteen years of age, in school (69.09 per cent as against 76.7 per cent for the whites), Delaware stands fourth in the list of the Southern states. In illiteracy, 12 per cent of the total population, ten years of age or over, was illiterate in 1900. Among the total white population, 7 per cent; among the negroes, 38.1 per cent; and among the foreign-born whites, 18.3 per cent were illiterate. In 1907, a compulsory attendance law was enacted, which requires all physically and mentally capable children, between the ages of seven and fourteen, to attend school five months in each year, but the same law gives to each district the right to reduce the time to three months, and excuses all children living over two miles from a schoolhouse from the provisions of the law. The assessor is to compile a school census, seven to fourteen years, each year, and send a copy to each principal teacher to help him in his duties. Any town may appoint attendance officers, but, if it does not, the secretary of each school committee is instructed to enforce the law. The County Superintendent, and, in the city of Wilmington, the City Superintendent, is to mail the notices to delinquent parents. If the officials fail to enforce the law, they are to be fined $25, and the state is to withhold, in addition, one fourth of the state apportionment to the district.

The curriculum of the schools is confined to the elements of the common school branches. Manual training is taught only in the city of Wilmington. Graded schools, in which advanced instruction in the elementary school branches and possibly the beginnings of high school work are given, have been organized in most of the towns. The rural school buildings are very poor, particularly in negro school districts.

Teachers and Training. — At the last report the state employed 897 teachers, 17 per cent being men. The average salary of all teachers in the state, the city of Wilmington included, is only about $40 a month; many teachers in rural districts are teaching for $25 or less. Three grades of teachers' certificates are issued by county superintendents on an examination on questions prepared by the State Board of Education. Teachers in graded and teachers in ungraded schools have separate sets of questions, and these questions are again divided for teachers in white schools and for teachers in black schools. A professional certificate is valid for ten years; a first-grade certificate for five years; and a second-grade for two years. The grade of certificate is determined, in part, by the percentages made in the examination. County superintendents may endorse certificates from other counties and give graduates of colleges and normal schools a one-year certificate without examination, but no provision exists in the law for recognizing the certificates of teachers from other states. The state maintains no normal schools, but each county school committee is allowed $1000 a year, to aid pupils to study in approved normal schools elsewhere, the maximum grant being $2 per week; and the pupils aided are required to obligate themselves to return and teach in the county for a stipulated time.

Secondary and Higher Education. — There are nineteen public and three private high schools in the state, of which one public high school is open to the colored race.

The state college for colored students at Dover, opened in 1892, and Delaware College at Newark, opened in 1834, and reorganized as a state land-grant college in 1869, are nominally state institutions, and occasionally receive some aid from the state; but their income for yearly maintenance comes almost entirely from interest on endowments, grants from the Federal government, and student fees. Both are small institutions. There are no other higher institutions in the state. The Ferris Industrial School for boys, at Marshalltown, and the Delaware Industrial School for girls, at Wilmington, are two schools of a reformatory type, which are aided by the state.

E. P. C.

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DELINQUENTS. — See CORRECTIONAL EDUCATION.

DELIRIUM. — A general name given to a collocation of mental states of a transitory nature, with or without an accompanying bodily or other mental disease. The mental states which together constitute delirium are disorientation, incoherence, hallucination, followed by an amnesia (*q.v.*) for most of the time during which the incoherence and disorientation persisted, and sometimes an amnesia for events preceding the delirium. In addition to the mental abnormalities (*q.v.*) just mentioned, other psychic disorders are sometimes found, but these appear to be incidental rather than necessary. A few authors dispute the view that hallucinations are necessary to constitute a delirium, but most authors consider them an essential element of the disease. In any case they are known to be found in a very large percentage of cases, and for present purposes they may be considered an intrinsic part of the delirium, and the discussion of their essential rôle be considered an academic question. The mental state in dreaming is similar in many respects to that found in delirium. (See DREAM; SLEEP.)

Delirious states may accompany infections of different kinds, with their resultant fevers, defervescence, and collapse. Inanition, various traumata, extreme cold, extreme heat, asphyxia, anemia, and many other abnormal bodily conditions are accompanied by deliria. In addition to the deliria accompanying infections, which may be described as auto-toxic, others are found after the taking of drugs. Alcohol, morphine, and hasheesh are well-known producers of delirium, but hyacine, cocaine, the bromides, acetanelid, and many other medicinal agents also produce the condition, especially after long-continued use.

In children the effects of delirium may be noticed for much longer periods than in adults, and the practice is to be commended of keeping such children away from school for several weeks after the delirium and any physical effects of the bodily disease have disappeared. If permitted to take up school work too soon after an attack of delirium, the child may again become delirious, particularly noticeable at night or in sleep if not in the waking state, and permanent mental injury may result from the mental stress. In the school training of children the possibility of an amnesia for a period preceding the delirium should be kept in mind, and in each case the memory of school work should be determined by the teacher both for the benefit of the child and to prevent time waste of herself and that of the other children in the class.

S. I. F.

See ABNORMAL; ALCOHOL, THE USE AND PSYCHOLOGICAL EFFECT OF; INTOXICATION.

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DELL, WILLIAM. — Master of Gonville and Caius College, Cambridge (1649–1660). He was a Puritan leader, who declaimed against "the gospel of Christ according to Aristotle." His views on education are to be found in a tractate, *The Right Reformation of Learning, Schools and Universities, according to the State of the Gospel, in the true light that shines therein.* He regards the civil power as by right entitled to take care of the education of youth. Schools, if wanting, should be erected throughout the whole nation, not only in cities and great towns, but also as much as may be in all lesser villages. No women, " but the most sober and grave," should be permitted to teach village schools. Magistrates must give encouragement and assistance. The subjects of instruction should be: to read their native tongue, and to read the Holy Scriptures. In the greater schools of the cities and greater towns, Latin and Greek should be taught, and Hebrew, " the easiest of them all," for the Old Testament's sake. All heathenish authors should be avoided, for it is better " to want their language than be possessed of their wickedness." Christians should forget the names of Greek and Latin gods and muses. In universities and colleges logic and mathematics should be taught, also physics and law. The following very important passage has not received its due attention. " Why universities or colleges should only be at Cambridge and Oxford, I know no reason. . . . It would be more advantageous to the good of all the people, to have universities or colleges, one at least in every great town in the nation, as in London, Essex, Bristol, Exeter, Norwich, and the like; and for the state to allow to these colleges competent maintenance for learned men to teach there." Further Dell suggests that school and college education should not be entirely bookish. " Youth should spend some part of the day in learning or study, and the other part in some lawful calling, or one day in study and another in business."

F. W.

DELSARTE. — Under this name a system of æsthetic and relaxing exercises has been promulgated in the United States, chiefly by Steele MacKaye, Genevieve Stebbins, Emily Bishop, and Anna Payson Call. The founder of the system was François Delsarte, a Frenchman, born at Solesme in 1811. At the age of twelve he was sent to Paris to study painting on china, but his tastes carried him in other directions, and he became, in 1825, a pupil of the conservatory, a government institution for instruction in acting, music, and the ballet. Here he lost his singing voice, and, finding himself incapacitated for the stage, he resigned that career to study and teach elocution and dramatic art. He developed what he termed the laws of æsthetic science. His chief idea was the expression of emotions through definite attitudes and movements of the different parts of the body. Delsarte attempted to classify and make scientific the empiric rules of the pantomime, for he believed that the perfect reproduction of the characteristic posture will produce the emotion depicted by the actor. He had particular positions and movements for fingers, hand, forearm, entire arm, head, torso, foot, lower leg, entire leg, entire body, eyelids, and lower jaw. Delsarte died in 1871, without having realized his great ambition of revolutionizing dramatic expression. Delsarte, himself, made very little use of gymnastic movements, and then only to give his pupils perfect freedom of movement in gesture. " Delsarte's exercises were very few, very simple, and in no wise capable of developing the human organism in a physical sense, and certainly were not worthy the name of system. Delsarte æsthetic gymnastics is purely an American idea, first suggested by Steele MacKaye, and brought to its present stage of perfection by Americans." (Stebbins.)

The American Delsarte system of physical culture is based on three principles: (1) relaxation, or ability to rest, (2) energizing, and (3) deep breathing, principles which have been accepted in all schemes of physical training on the basis of well-known physiological laws, but without resort to the fanciful and meaningless expressions employed by the advocates of Delsarte, such as " the higher dynamic qualities of air," " the storage of oxygen within the cell walls of the lungs is a mystic force," " dynamic breathing, the pivot of all culture." In its Americanized form the Delsarte method was popular for a time in schools for young ladies and in society, but it occupies a very small place in modern scientific physical education. G. L. M.

See Breathing Exercises; Gymnastics.

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DELUSION. — In general a delusion may be defined as a false belief, not directly and immediately dependent upon sensory stimulation as is an illusion (*q.v.*) or an hallucination (*q.v.*). While all false beliefs have been called delusions, only those should be thus designated which are of a more or less permanent and effective character and not consistent with the environment. The following criteria must be satisfied in order that a false belief be properly called a delusion. (1) The belief must be opposed to the experience and beliefs of the great majority of those associated with the believer; *i.e.* the belief is wrong and not true to the known facts. (2) The belief cannot be corrected when there are brought to the individual's attention other recognized and believed facts inconsistent with the special belief; *i.e.* the belief is not changed when suitable and appropriate arguments are brought forward. (3) The belief brings about definite types of action based upon it, often opposed to the well-being or to the good of the people in the environment. For example, the childish belief that the moon is made of green cheese or that of the adult that the sun revolves around the earth are false beliefs, but they are usually ineffective and not necessarily inconsistent with previous education and with the environment. They are, therefore, not called delusions except in a popular way. The belief in the possession of great wealth is a delusion if it is inconsistent with the knowledge of other individuals in the immediate environment; if, for example, the believer is in rags and can produce no money or get no credit for the purchase of better clothing of which he appreciates the need, or if he attempts to make purchases out of proportion to his actual means and needs. The belief of the uneducated negro in voodoo or of the uneducated white in good and bad fairies, on the other hand, may lead to definite and suitable actions and may not be removed by an appeal to reason, but so long as these beliefs are consistent with their education and with the ideas of their fellows they are called false beliefs and not delusions.

Delusions are classed as follows: (*a*) fixed, when they persist for long periods; (*b*) changeable, when they remain for only a short time or give way to another idea of a delusional character; (*c*) systematized, when they are brought into relation with all other life conditions; and (*d*) unsystematized, when the relational element is not marked. According to Wernicke all ideas may be classed in one or more of the following ways: Those relating to the external world; those relating to the body; and those relating to the mental self or to the mind. Delusions may arise in any or all of these spheres which are called, respectively, allopsychic, somatopsychic, and autopsychic. This is the best classification of delusions, and it may be well to give examples of each of these. Allopsychic: being persecuted, or poisoned, or called names; somatopsychic: having no body, or no limbs, being pregnant, having animals in the abdominal cavity; autopsychic: being royalty, God, or Christ, or a great inventor, of having committed the unpardonable sin. Often the delusion is of a mixed character, and applies to two or all three spheres.

It has previously been said that the delusions are not based upon sensory elements, but it may now be remarked that some of the delusions undoubtedly originate in some form of sensory stimulation, usually of the character of a paræsthesia. Some delusions are explainable on the ground of perceptual disorder, and they are, therefore, allied to hallucinations, but in many cases the sensational or perceptual element is not evident. It appears likely that all of the somatopsychic and most of the allopsychic delusions are based upon changes in the character of sensations, and in this connection special interest attaches to the little-understood afferent impulses mediated through the sympathetic nervous system. S. I. F.

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DEMENTIA. — A general term referring to certain forms of insanity which are not accurately definable in specific mental terms, but which in a general way may be said to be a more or less permanent deterioration or breakdown of the normal mental capacity. The term is not so broad as and is not synonymous with insanity (*q.v.*), nor with feeble-mindedness. The word is intended to describe the decrease in ability to meet social and other conditions, taking as the basis of comparison the ability which was normal for the individual. In this sense it is and may properly be used of the feeble-minded (especially of the high-grade imbeciles or the so-called cases of psychopathic inferiority) who had advanced to a certain point and then deteriorated.

(1) The form of dementia best known to non-medical people is that found in the aged, in whom there is a gradual bodily and mental enfeeblement, so that in the last stages the individual becomes like a young child and must be taken care of in the same manner as is an infant. The marks of this condition are defects of memory and inability to respond to new stimuli, on the one hand, and the recall of certain facts of early life on the other. Lack of judgment and defective memory are accompanied by irritability, egotism, and delusions, with occasional epileptiform attacks and paralyses (*q.v*).

(2) Arterio-sclerotic dementia is dependent on hardening of the arteries and the consequent interference with the cerebral circulation, and may appear at any age after middle life.

(3) The mental state in *dementia paralytica*, general paralysis of the insane, or paresis (*q.v.*), resembles to a marked degree that in senile dementia, but it occurs usually in those of middle life and always on the basis of a previous syphilitic infection.

(4) To the educator the dementia beginning at or about the age of puberty is of much more interest and importance. (See article on Adolescence.) This is the form of insanity called by Kraepelin *dementia precox* (*precox* = " precocious " or " early "). This disease is insidious and progressive, and it seems to depend upon certain maladjustments to the environment. For example, the history of a patient shows that when young he did not play well with his companions, that he preferred to be alone, that he showed a lack of interest in many things that boys delight in, and that many occurrences of a usually emotional character did not affect him. In contradistinction to this, it is often found that he was a better student than his fellows, and perhaps had been extraordinarily bright. In succeeding years the abnormal characteristics become exaggerated, new ones are added, and then a typical picture of beginning dementia is seen. The exhibition of rather definite characteristics enables the psychiatrist to divide these patients into three classes: —

(*a*) *Hebephrenic.* In the early stages of hebephrenia the mental condition of a patient does not differ essentially from those in patients with catatonic and paranoid dementia precox. At a certain stage, the date depending upon unknown factors, there is usually an abrupt mental change. The individual becomes depressed; hallucinations, usually of an auditory character, develop, and from the hallucinations, or even independently of them, delusions arise. The attention is weak, and most of the time the patient gives no heed to what is going on about him. Very often the hallucinations are of voices saying unpleasant and disgusting things. At first the patient is usually depressed, and the delusions are such as comport with the feeling tone. Later the delusions change, and are usually shallow and fleeting. If the patient talks, it becomes evident that there is a poverty of ideas and that his ideas are loosely strung together. Mannerisms are often shown, an echolalia or a mild form of catalepsy (*q.v.*). Added to these is an emotional deterioration, evidenced by the inadequacy of bodily reactions as compared with the vocal expression of emotion-producing (*i.e.* productive of emotion in a normal person) ideas. In the later stages the dementia becomes more marked, and expressed ideas are confused and incoherent. At times speech becomes a "word salad," in which words are joined to make sentences which have no meaning to normal people.

(*b*) *Catatonic.* On account of the gradual onset it is difficult to set a date for the beginning of the catatonic form of dementia precox. All one can usually say is that the early symptoms of maladjustment become gradually exaggerated, and eventually develop into a stuporous or into an excited state. Throughout the course of the disease these two states continue and may alternate. If the patient becomes stuporous, he lies or sits or stands in one place and shows little or no reaction to any form of stimulus. Sometimes the body is tense and rigid; attempts to move its parts are met by opposing movements of the patient (negativism); sometimes the opposite condition of catalepsy (*q.v.*) or *flexibilitas cerea* is present, and an increased suggestibility is shown in other ways: in speech by the repetition of phrases heard by the patient (echolalia); in movement by the repetition of movements which he has seen (echopraxia). An excited stage may be present in which there is motor unrest and a marked flow of speech. However, the movements are usually aimless and speech is incoherent, although both of these activities appear at first glance to have a marked resemblance to those in simple mania (*q.v.*). Occasionally a veritable rage occurs, in which the patient bites himself, flings himself about, dashes his head against the wall, etc.

(*c*) *Paranoic.* The paranoic form resembles paranoia (*q.v.*), in the presence of fixed ideas, delusions of grandeur or of persecution. It differs from true paranoia in that it leads to a mental deterioration, while paranoia does not lead to this condition, unless the presence of delusions may be said to be an evidence of dementia. In addition, hallucinations, emotional deterioration, depressions and excitements, and mild cataleptic symptoms, or exaggerated suggestibility may be present.

A remission or a return to an approximate normal condition is seen in a small percentage of these cases, but it is doubtful whether a complete mental restitution ever takes place. Not sufficient is known about prophylaxis in these cases, but comparisons of large numbers of these patients indicate that early recognition and prompt treatment retard to a great extent the appearance of profound dementia. According to Kraepelin's statistics, about one seventh of all admissions to insane hospitals are cases of dementia precox. When we bear in mind that this is a disease of long duration, and that most other mental diseases are comparatively short, it can be understood that about one third of all inmates of insane hospitals are of this class. About two thirds of all these cases show sufficiently marked abnormal traits to be committed to hospitals before the age of twenty-five. The latter fact, in conjunction with the statistical evidence regarding the value of early treatment, indicates plainly the importance of a knowledge of the general symptomatology of the disease by those interested in educational problems. S. I. F.

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DEMERIT MARKS. — See Marks, School.

DE MIST, COMMISSIONER. — See South Africa, Education in.

DEMOCRACY AND EDUCATION. — The connection of education and democracy may be viewed in two ways. On the one hand, democracy requires for its perpetuation a more widespread education of the members of the state than does an oligarchic or aristocratic state. Since all the voting citizens are in theory, and to some extent in practice, the rulers of the state, they must be educated if legislation and administration are to be sound, orderly, and progressive. On this account the entire modern movement in education for common, or public, schools supported by taxation with attendance more or less compulsory is closely connected with the democratic extension of suffrage and civil responsibilities. In distinction from this political and more external relation of democracy to education stands the part that democratic ideals play in the constitution and conduct of the school itself, whether as respects its methods of government and enforcing order, or methods of teaching and the subject matter of the curriculum. Democracy inevitably carries with it increased respect for the individual as an individual, greater opportunity for freedom, independence and initiative in conduct and thought, and correspondingly increased demand for fraternal regard and for self-imposed and voluntarily borne responsibilities. Insensibly, rather than consciously, the atmosphere characteristic of democracy penetrates school methods and materials and modifies educational ideals. J. D.

See Citizenship and Education; Individuality; Education; School and Life.

DEMONOLOGY. — In the effort to explain the facts of nature under the categories of personality primitive man developed belief in a great variety of spirits or demons who inhabit natural objects of all types. These demons were controlled by incantations and devices, which when thoroughly understood and formulated constituted a supposed body of knowledge designated demonology. The demon is not at first regarded as malign.

See Mythology; Social Psychology.

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DEMONSTRATION. — In its literal and etymological sense, demonstration means showing something to be thus and so, pointing to an object that exists or an event that occurs so as to induce perception of it. In this sense lectures in anatomy demonstrate the structure of the human body, or a lecture in physics demonstrates some fact by performing an experiment. In a technical logical sense, demonstration is equivalent to proof. Proof, however, has a wider and a narrower (stricter) sense. In its broad sense, to prove is to try, to test; and any proposition is said to be proved in the degree in which it emerges successfully from such experimental or logical tests as may be applied. In its stricter sense, demonstration means conclusions that follow with rigid necessity from premises which are themselves regarded as necessary truths, or which are derived from such self-evident truths. Since axioms, rigid definitions, and consistent rules of operation are necessary to demonstration in this sense, the mathematical sciences are alone strictly demonstrative. The three senses indicated taken in the order given cover the evolution of demonstration in educational practice. In any new subject, all that is required at first is to make out the topic clearly, to show it forth, — demonstration is psychological rather than logical. And in most topics persuasion and thorough belief attend upon clear familiarity rather than upon seeing the logical dependence of conclusion upon premise. Then come certain operations of testing, of checking and corroborating, and finally efforts at a deductive, or logically rigid, system. To attempt this type of demonstration at the outset is always a mistake. J. D.

DEMONSTRATION, METHOD OF. — One of the objective methods of presentation in teaching in which the instructor himself conducts the experiment, dissection, examination, etc., in the presence of the class. The method of demonstration is frequently used when the laboratory method, in which each student conducts the work himself, is not feasible. It is much used in the natural sciences and in medical instruction. It is applicable in almost any subject where objective teaching is needed.

See Laboratory Methods; Objective Methods.

DEMONSTRATION SCHOOL. — A term introduced by Professor J. J. Findlay for the school for observation, demonstration, experiment, research, and practice attached to departments of education in universities performing the same function as hospitals, laboratories, apparatus, libraries, and field work in other departments of study. In the demonstration school the theoretical lecture of the classroom finds its realization in practice. The term as adopted and used by the English Board of Education hardly differs from the ordinary practice school.

See the articles on Experimental Schools; Practice Schools; Teachers, Training of.

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DE MORGAN, AUGUSTUS (1806–1871). — A well-known English writer on mathematics.

He was born at Madura, India, in 1806, and died in London, in 1871. He entered Trinity College, Cambridge, in 1823, and was graduated as fourth wrangler in 1827. He early showed considerable mathematical ability, but never concentrated his attention sufficiently upon any one subject to win for himself a high position as an original mathematician. He was the first professor of mathematics in University College, London, having been elected in 1828. He resigned the chair in 1831 as a protest against the action of the authorities in dismissing a colleague without assigning their reasons, but was reëlected to the same position in 1836, and held the chair until 1866, when he resigned.

De Morgan was a great bibliophile, and his collection of early mathematical works was extensive. His library was purchased after his death by Lord Overstone, and was presented to the Goldsmith's Society, and by it was deposited in the University of London, where it now remains. De Morgan was an indefatigable worker, and was connected with various important societies, in particular the Astronomical Society, the Society for the Diffusion of Useful Knowledge, and the London Mathematical Society. He contributed many articles on the history, theory, and teaching of mathematics, to the *Penny Cyclopedia* and the *Companion to the British Almanac.* His best-known works include the following: *Essay on Probabilities* (1838), *Arithmetical Books* (1847), *Formal Logic* (1847), *Trigonometry and Double Algebra* (1849), and various textbooks and monographs. His textbooks are characterized by an eccentric form of learning that renders them very helpful to teachers, but unprofitable types to be followed by textbook writers.

His son, George Campbell de Morgan, gave much promise as a mathematician, but he died in 1867. His widow wrote a *Memoir* of her husband which was published in 1882.

D. E. S.

DEMOTION. — A term sometimes used to signify the opposite of promotion. It designates the placing of a pupil in a class below that in which he happens to be, and with which he is unable to keep pace.

See GRADING AND PROMOTION.

DENDRITE. — All of the highly organized nerve cells are supplied with branches through which stimuli may enter the nerve cell. These branches which lead into the nerve cell are short as contrasted with the long fiber which leads out of the cell. The short branches are also supplied with many minor rootlets, and the whole branching structure is known as a dendrite. The dendrites are of great significance in the organization of the nervous system, because they constitute definite paths along which nervous impulses may travel. In early stages of embryonic life the cells are not supplied with dendrites; and the dendrites of the higher animals are much more complex in structure than the dendrites of the lower animals. The interlacing of dendrites with the dendrites of other nerve cells and with the terminations of the longer nerve fibers constitute the most important points of organization in the nervous system.

See SYNAPSE.

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DENISON UNIVERSITY, GRANVILLE, OHIO. — A coeducational institution founded in 1831 and controlled by the Baptists of Ohio. The plant includes fourteen buildings used for purposes of instruction and dormitories. The university includes Granville College for men and Shephardson College for women, Doane Academy, Shephardson Preparatory Department, a conservatory of music, and a school of art. Students are admitted on certificates from approved high schools or by entrance examinations requiring fifteen units without condition. Three degrees are conferred on the completion of the college course: Bachelor of Arts, Bachelor of Science, and Bachelor of Philosophy. There are fifteen professors, four assistant professors, and thirty instructors and assistants on the faculty.

DENMARK, EDUCATION IN. — Form of government, constitutional monarchy. Present constitution, with modifications, based upon charter of June 5, 1849. The right of making or amending laws is vested in the Rigsdag, acting in conjunction with the King. Area of Denmark 15,592 square miles; subdivided into eighteen counties, and these into sixty districts. Population in 1906, 2,588,919. Capital, Copenhagen; population, 426,540. State religion, Evangelical Lutheran.

Educational History. — The early history of education in Denmark is similar to that of central Europe as a whole. It begins when Christianity spread into the country and schools were established by the religious orders of the Benedictines (*q.v.*) and Dominicans (*q.v.*) for the purpose of gaining converts and recruiting the ministry. Cathedral and convent schools (*q.v.*) were established in the latter part of the tenth century. Latin schools existed in the larger towns in the twelfth century. The University of Copenhagen (*q.v.*), founded by virtue of a Bull issued by Pope Sixtus IV, was opened in 1479, with three tutors, one in theology, one in law, and one in medicine.

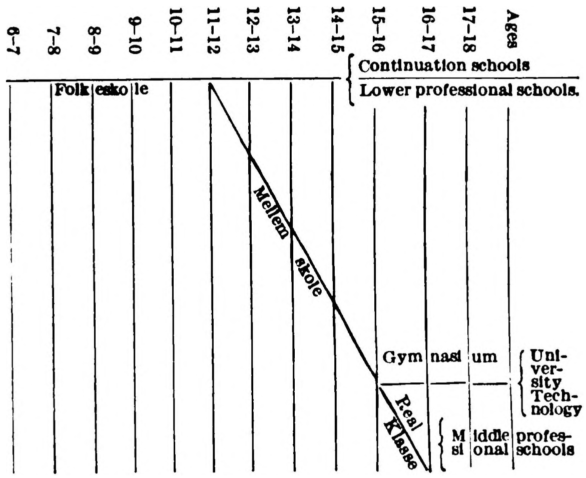
The Protestant Reformation (sixteenth century) found firm support in the Danish sovereigns, and schools and Bible teaching, following the injunctions of Luther, were fostered by their direct efforts. Under these new impulses the former Latin schools were organized in two grades, higher and lower, both of which were under the supervision of the Lutheran clergy. The municipal authorities of some of the towns established writing schools (*q.v.*) for the poorer classes. Little attention, however, was given to schools in the country. Where there were such, the buildings were poor, and the teacher was obliged to engage in some other work for a part of the year. Under the watchful care of the clergy, the catechism (*q.v.*) was taught to most of the children. King Frederick IV (1699–1730) endeavored to increase and improve the provision for popular instruction. He gave orders for the building of 240 schoolhouses, twenty in each of the twelve districts, each house consisting of a schoolroom and dwelling for the teacher. The schools were regulated and the salaries of the teachers fixed by royal decree of 1721. By this decree, children between the ages of five and eight years were required to attend school daily for five or six hours; after the age of eight they must attend for half of each school day. Religious instruction and reading were made obligatory, while arithmetic and writing were optional studies. During the reign of Christian VI (1730–1746), the schools were reorganized and more importance was attached to public instruction. Parish schools were established in all the towns, and in the larger villages (1739). In order to provide sufficient funds for the lower grade schools, some of the higher Latin schools were closed. The subjects of primary instruction were those previously fixed for public schools. Further efforts were made during the eighteenth century to improve and extend the system of instruction, but on account of the poverty of the peasant class, and non-support of the wealthier class, little was accomplished.

Toward the close of the eighteenth century the ideas of Rousseau and Basedow created a new interest in education, the practical effects of which were realized when the schools founded by Rochow (*q.v.*) in Rekahn (Germany) became models for Danish primary schools. A more important result of this awakening was the appointment in 1789 of the High Commission of Schools, charged with the reorganization of the entire school system. The recommendations of this body were made the basis of new school laws, which went into effect in 1814. They required that the expenses of the primary schools should be borne by the communes; provided for the establishment of two-class elementary schools in such rural districts as could support them, and of two schools in each of the larger villages. Evening classes for adults were to be maintained in the larger towns. The laws also made school attendance compulsory for children between the ages of seven and fourteen. In the interests of economy, teachers in the villages and rural disstricts were authorized to act as churchwardens. This new era in education also gave birth to the normal school. By royal decree of 1789 the first normal school had been established at Blaagaard, near Copenhagen; five more normal schools were established in different parts of the country when the law of 1814 went into effect. In 1799 a private school for gymnastic training was opened in Copenhagen; later this became a public institution for the training of teachers; and in 1828 gymnastics were introduced into all the schools of Denmark. The monitorial system (*q.v.*), or system of mutual instruction, was introduced into Denmark in 1824 by Captain J. Abrahamson, who had observed its effects in France and induced Frederick VI to permit its use in the schools of his kingdom. The method was extensively employed as late as 1841.

Up to this time Denmark had been affected mainly by currents of influence from other countries. But conditions within, during the period of social and political unrest which reached a crisis in the war with Germany (1848), were of such character as to develop and set free the native forces. In educational affairs these took the form of a demand for more practical instruction and at the same time a desire to increase the opportunities for education. As a result the Latin schools were transformed into Real schools (*q.v.*), *Realskoler*, and gymnasia, and a further movement, but of greater significance, was the foundation of the People's High Schools, *Folkehöjskoler*, under the inspiring influence of Bishop Grundtvig, the poet, philosopher, and reformer of the Danish national movement. An incident of this general movement was the interest excited in the instruction of girls. The leader in this cause was Miss Natalie Zahle, who in 1851 opened a school to prepare young women for teaching. As a result schools for girls were soon established in all the larger towns. The cause of popular education was thwarted for a time by the final struggle with Germany (1864). But the foundation had been laid, and the educational movement soon revived with full vigor. Since that time there have been no noteworthy changes in the general character of the different classes of schools, but there has been gradual improvement along lines already marked out, with a general movement toward a unified system.

Present System. — *Control of Schools.* — Danish schools have always been closely associated with the Church. Throughout the long history from their incipiency, when they were supported by the Church and entirely under its control, until the present time, when church control is merely nominal, the movement toward secularization has been gradual. For this reason, religious instruction has always been given an important place in the curriculum. But the system of instruction has profited by the nurture of the Church. The clergy were the first teachers, and continued to care for the rural population as long as there were no free public schools. The Reformation caused no upheaval in school and Church, as in other countries, consequently no interregnum in their services. At present both the bishops and clergy serve as members of school committees, *ex officio*, and aid in the selection of teachers and the administration of the schools.

Apart from this relation to the Church, school affairs in Denmark are under the supervision of the civil authorities. The control of the system is vested in the Minister of Ecclesiastical Affairs and Public Instruction, who has supervision of all schools, including the university; but certain rights are delegated to the local authorities. The principal duties of the minister in regard to education, are to inspect and regulate schools, gather statistics, and apportion the school fund. For purposes of local administration each county has its school council, or *Skoleraad*, whose duties pertain largely to the finances of the schools; each district of the county has its school board or *Skoledirection*, who appoint the teachers, arrange the course of study, and aid in the selection of books; each commune and each village has its school commission, *Skole-commission*, which looks after the interests of the individual school. For inspection of secondary and higher schools the Minister of Ecclesiastical Affairs and Education is assisted by special inspectors and the bishops of the Church.



The lack of close connection between the primary schools and secondary schools led to the enactment of a new law (1903), the object of which is to base secondary education on primary education and to coördinate all the schools, from the lowest to the university, in one system.

The school system as thus organized consists of the *Folkeskole*, or elementary school, compulsory age for attendance from seven to fourteen; the *Mellemskole*, or middle school, consisting of a four-year course, and a three-year gymnasium course which prepares for the university. After the eleventh year children may pass from the elementary school into the middle school. The organization of the school system is indicated in the above diagram.

Primary Education. — Primary instruction in Denmark is free to all classes of people, and all receive the elements of knowledge at least. There is practically no illiteracy. The system as a whole is similar to that of other countries of Europe, excepting for an unusual degree of local independence, and, as a consequence, more freedom in regard to the conduct of the individual school. The present school law is based on the law of 1814; and public elementary instruction, which was made obligatory for all children between the ages of seven and fourteen, may be said to date from that year. Until recently, however, the entire burden of the schools fell on the local authorities, and they often found it difficult to pay the salaries of the teachers, and consequently to maintain a school. In 1878 the State made appropriations for public schools, and has ever since devoted increasing amounts toward the salaries of teachers. The primary school is divided into three grades: the first or preparatory for children from seven to ten years; the second for children from ten to twelve years; the third for children from twelve to fourteen years. If the number of children in a school is not above thirty-five (thirty-seven in the country), the three grades may be taught together as one class; if more than thirty-five, the grades must be taught separately. Most of the rural schools have more than thirty-five pupils, hence have from two to three separate grades. The city schools have from six to eight grades. In the thinly populated districts the boys and girls attend the same school; but in thickly settled districts there are separate schools for the two sexes. The average number of pupils in the state primary schools of the country is 65; in the state primary schools of the towns is 390; while the average for the state primary schools of Copenhagen is 1280. In regard to the choice of textbooks there has always been much freedom. The textbook for religious instruction must be one approved by the Minister, and the courses in music and gymnastics are officially outlined; as to the other textbooks, the choice rests with the teacher and the local school authorities. The course of study for the three grades, and the number of hours per week for each subject, are as follows: —

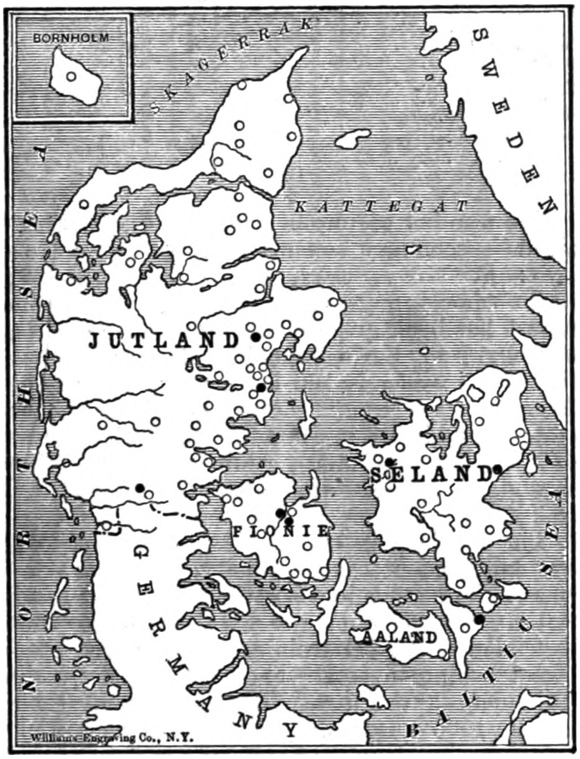
	1	2	3
Religion	$\frac{4}{2}$	3	3
Danish Writing	9	8	8
Arithmetic	$\frac{6}{2}$	3	3
History Object Lessons Geography Natural Science	$\frac{6}{2}$	3	3
Singing	$\frac{2}{2}$	1	1
Total	18	18	18

The minimum number of hours of instruction is eighteen per week in the country, besides gymnastics, sloyd, and hygiene, or needlework for the girls; and twenty-one hours in the towns besides the above-named subjects and domestic economy for girls. In addition, mathematics and a foreign language may be taught in the town schools. The minimum length of the school term is 240 days of six hours each. The average cost of the public elementary schools of Denmark for the years 1900–1905 was 12,970,599 kr. ($3,476,121) (1 krone = 26.8 cents gold, of which amount the State gave 1,600,000 kr. ($428,800). The state aid for primary instruction for 1906–1907 was 2,930, 000 kr. ($785,240). The average cost per individual (1900–1905) for primary instruction was 5.20 kr. a year, or slightly above $1.39. The total number of children of obligatory age in school, in 1905, was 392,930; to this number may be added 16,092 children under seven years of age in private schools and lycées, making a total of 409,022 receiving primary instruction.

Teachers' Training Schools. — The teachers of the primary schools are educated in the normal training schools, of which there are four public and fifteen private having a three-year course, and one public and three private, having a one-year course. The latter schools are for teachers of the first grade (7–10 years) of the primary schools. The four .public normal schools are for men, and the fifteen private schools are about evenly divided between the sexes, a number of them being coeducational. To enter the state normal schools the applicant must be at least eighteen years of age and must have taught one year. The preparatory year of teaching is usually passed in some private school. The course of study for normal schools includes religious instruction, pedagogy, Danish language, history, geography, zoölogy with botany and a little geology, physics, mathematics, writing, singing, violin and organ, gymnastics, and manual training. A teachers' high school, open to both sexes, has been established for the further instruction of primary teachers. This school affords opportunity for specializing by offering courses for either a six-months' or a year's term of study. For either period there is a wide range of subjects from which to select. The tuition at the state normal schools is 40 kr. ($10.72) a year, and the entire expenses for the year about 340 kr. ($91.12). The tuition at the private normal schools is about 150 kr. ($40.20) a year. In 1906 there were 241 men and 149 women attending the state normal schools. The *Pedagogiske Selskab*, a teachers' association, organized in 1820 for the discussion of educational questions, has been of service to many teachers, and has also had great influence in shaping educational affairs.

Salaries and Pensions. — The amount of salary the teacher receives depends upon the importance of the position, whether in town or country, and also varies with the length of service. The men receive their maximum salary after twenty years' service, the women after twelve years' service. For the country the maximum salary ranges from 800 kr. for a first-grade (children from seven to ten) teacher to 1600 kr. for a head teacher, while in the larger towns the maximum salary ranges from 1500 kr. for a woman to 3600 kr. for a head teacher. Teachers in the country under permanent appointment have free residence, fuel, and a small piece of land for cultivation. In order to obtain a fixed position and consequently a free residence, the teacher must pass the regular teacher's examination, must profess the doctrines of the Lutheran Church, must be at least twenty-five years of age, and have had four years' successful experience in teaching. As employees of the State, teachers acquire the right to a pension after five years' service. The maximum pension allowance, which amounts to about two thirds of the salary, is received after thirty years' service. In granting the maximum pension the experience in teaching previous to the age of thirty is not recognized. The State appropriates for pensions about 850,000 kr. ($227,800) a year.

People's High Schools (*Folkehöjskoler*). — Few countries offer such opportunities for continuation study beyond the elementary schools as Denmark. This has been made possible by the establishment of people's high schools which have for their object the enlightenment of the peasant and agricultural classes. These institutions are unlike secondary schools, are original with the Danish people, and, in so far as they differ from other schools, form a distinctive contribution to educational methods. They were founded on the pedagogical ideas of Bishop Grundtvig(*qv*), who believed that the individual derived most benefit from instruction between the ages of eighteen and twenty-five; that history and religion fill the mind with new and inspiring ideals; and that the individual also should have special training in the practical matters which may aid him to improve his living conditions. Consequently, while there is great freedom in the choice of subjects taught in the schools, history and religion are given prominent places for their inspirational value. Apart from these two leading subjects, the student has the opportunity to select from the wide range of subjects those of immediate utility to himself. The first of the people's high schools was opened at Rödding in 1844, and in 1864 was moved to Askov. This institution has become the centre of the whole movement and attracts students not only from Denmark, but from Iceland, Finland, the Faroe Islands and the United States. Their purposes and methods met with popular favor, and the number of schools has gradually increased until now there are seventy, besides fourteen agricultural schools organized in a similar manner. Other Scandinavian countries adopted the system, and Danish colonies in America carried the idea thither. The schools are intended for adults from eighteen to thirty years of age. There is entire freedom in respect to the choice of subjects, appointment of teachers, and method of instruction. In some cases stress is placed upon science; in others upon technical subjects. There are no entrance or leaving examinations. Instruction is given almost entirely by lecture, and includes history, religion, Danish language and literature, mathematics, science, singing, gymnastics, and practical subjects, the last named relating as a rule to agriculture and farm life in general.



Map of Denmark with location of People's High Schools (○) and Schools of Agriculture (●).

Instruction in the last branch is now given in specific technical schools which sprang out of and are conducted in the same spirit as the high schools, which students usually attend before specializing. The schools are usually held for two terms a year, a five months' term during the winter months for men, and a three months' term during the summer for women. The cost of tuition for the longer term is 50 kr., and the entire expenses, including cost of living for the five months' term, about 162 kr.; for the three months' term about 102 kr. The number of students in 1907 was 3273 men and 3266 women; the agricultural high schools registered 1131 men and 108 women. The state aid to the schools for 1906 was 433,000 kr. ($116,044); of this sum 252,000 kr. was used to help defray the expenses of needy students.

Other Continuation Schools. — Beside the people's high schools, there are other opportunities for continuation study in the evening schools scattered throughout the country. In these schools there are about 20,000 pupils. There are also evening schools in the cities, having about 3000 pupils.

Secondary Schools. — The Danish secondary schools are characterized by the thorough, careful training common to this class of schools in central Europe. Their history is that of the reorganization and development of the Latin schools which have existed in Denmark since the twelfth century. At the beginning of the nineteenth century the number of secondary schools for boys in Copenhagen was twenty-two, with 1206 students; outside of Copenhagen there were eleven schools, with 249 students. Secondary education was modernized in 1809, when the sciences were given a more important place, and again reorganized in 1850 by the establishment of *Realskoler* and gymnasia. The gymnasia prepared for the university, the *Realskoler* for business or for the middle professional schools (industrial, technical, and commercial). Hence the establishment of the *Realskoler* was a decided step toward making instruction practical, and was a part of the larger movement in Denmark in behalf of popular education. The two classes of schools were both outgrowths of the old Latin schools, and consequently were often conducted in the same building and by the same faculty. The age for admission was the same in both cases, *i.e.* twelve years. The gymnasia had a six-year course of study, and the *Realskoler* a course of four years. The work of the latter school was completed by the *Realexamen*, the leaving examination, which was accepted as an entrance standard for middle professional schools. This dual system was continued with few modifications until 1903; but the relation between secondary and primary schools was not satisfactory. Each class of schools was conducted independently of the other, and the primary pupil was not always prepared to enter the secondary school. As a consequence of these defects, the whole system was reorganized, and a new class of schools established, the *Mellemskoler*, or middle schools, which, as the title suggests, form a link between the formerly separate parts of the system of public instruction. The *Mellemskole* offers a four-year course, to which is added an extra year for those who desire to prepare for the *Realexamen.* The gymnasium offers a three-year course, for which the pupil is prepared by the *Mellemskoler*.

The secondary schools are now passing through a transition state, and hence any statements as to the number of the different classes of schools is of temporary value only. Previous to the last reorganization there were 165 *Realskoler*, thirty-three of which were in connection with Latin schools. The number of gymnasia remains the same, namely, fourteen state and four communal or town gymnasia. With these may properly be included sixteen "recognized" private schools. In order to be "recognized" a school must give evidence of permanency as an institution, and must have been in existence long enough for the teachers to prove that they can prepare pupils for the leaving examination of the class of schools to which it belongs. The privilege of having students admitted to this final examination is granted by the State, and is a guarantee of efficiency. Private schools that maintain this standing usually receive a grant from the State. For the *Realskoler* the State required that in addition to obtaining the examination right, they should enroll a specified number of pupils, should maintain a certain scale of salaries and a fund for teachers' pensions; it was also stipulated that the local authorities should contribute one fourth the amount given by the State.

Secondary schools for girls are not so numerous as those for boys, are comparatively small, and are not aided by the State. There are, however, schools for girls in all the cities and larger towns. Some of them prepare their students for the same examinations as are prescribed for the gymnasia and *Realskoler*. The law of 1903 opened the doors of most of the state schools to girls, thus virtually creating a new era in secondary education.

For all secondary schools the recitation period is fifty minutes, and the number of periods must not exceed thirty per week. The course of study for the *Mellemskole*, and the weekly program showing the time given to each subject, is as follows: —

SUBJECT	NUMBER OF HOURS A WEEK			
	First year	Second year	Third year	Fourth year
Religion	2	2	2	1
Danish	5	4	4	5
English	6	3	3	3
German		5	4	4
History	3	2	3	2
Geography	2	2	2	2
Biology	2	2	2	2
Natural Science	2	2	2	2
Arithmetic and Mathematics	4	5	6	7
Writing	2	1	1	1
Drawing	2	2	1	1
Gymnastics	4	4	4	4
Singing	2	2	1	
Total number of hours	36	36	35	34

The course of study for the extra year or *Realklasse* includes: Danish, four hours; commercial arithmetic, four hours; two foreign languages, eight hours; history and science, eight hours; optional, six hours; total thirty hours per week. Girls are allowed to omit commercial arithmetic and take optional studies instead.

The gymnasium offers three different courses of instruction; the classical, the modern language, and the mathematical-scientific. The subjects of study and number of hours a week are as follows: —

SUBJECTS	CLASSICAL COURSE			MODERN LANGUAGE COURSE			MATHEMATICAL-SCIENTIFIC COURSE		
	Hours a week			Hours a week			Hours a week		
	1st yr.	*2d yr.*	*3d yr.*	*1st yr.*	*2d yr.*	*3d yr.*	*1st yr.*	*2d yr.*	*3d yr.*
Religion	1	1	1	1	1	1	1	1	1
Danish	4	4	4	4	4	4	4	4	4
History	3	3	4	3	3	4	3	3	4
Greek	6	6	6						
Latin	6	5	5	4	4	3			
English[1]	2	2	2	5	5	5	2	2	2
German				4	4	4			
French	4	4	4	4	4	4	4	4	4
Archæology		1		1	1	1	1	1	1
Geography[2]	2	2	2	2	2	2	3	3	2
Biology									
Natural science							6	6	6
Mathematics	2	2	2	2	2	2	6	6	6
Gymnastics, Singing or Physical labor	6	6	6	6	6	6	6	6	6
Total	63	36	36	36	36	36	36	36	36

The number of pupils attending the "recognized" secondary schools in 1905 was as follows: *Realskoler*, boys, 15,261; girls, 11,137; Latin schools, boys, 1011; girls, 91. No official report has been given of the number attending unrecognized Latin schools. The tuition in the *Mellemskoler* is 120 kr. a year, and in the *Realklasse* and gymnasia 144 kr. a year. The state expenditure in 1906 for state schools was 475,000 kr. ($127,300), while grants to other secondary schools amounted to 109,000 kr. ($29,212).

The teachers in the state secondary schools are educated at the university. Having completed the academic work, they take the examination for secondary school teachers, then special pedagogical training, and, finally, practice teaching in some school approved by the university authorities. The number of teachers in 1906 was about 1650. The maximum salaries range from 2400 kr. for assistant teachers to 5000 kr. for principals. Residence is also provided for the principal. There are associations of the teachers of both the boys' schools and the girls' schools.

Summer vacation begins the eighth of July and lasts six weeks, and the total number of holidays, including vacation, must not exceed sixty-three school days.

The Schools of the Capital. — The seat of the university, of the royal library, the Classen library, and other institutions devoted to science and art, Copenhagen is naturally the center of the intellectual life of the kingdom. Its schools present the highest development of the general system of education, and the educational principles and methods approved by the experience of the capital city are rapidly followed, not only in other cities, but in rural schools as well. Hence the universal attention paid to the health and physical development of the young. Gymnastics form an important part of all school programs, and Copenhagen has fifty well-appointed gymnasiums belonging to the elementary schools. The service of medical and dental inspection has extended from the capital to all the cities of Denmark, and the provision of school baths is rapidly spreading. The care of the children does not end with the annual school term; summer colonies are maintained in the suburbs of nearly all the cities, to which children of the poor are sent for periods of refreshment.

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[1] Either English or German for classical and mathematical-scientific courses.

[2] Two hours a week for geography, biology, and natural science in the classical and modern language courses, and the hours indicated for geography and biology in the mathematical-scientific course.

The secondary schools of Copenhagen are well organized and maintain high standards. For girls private schools are preferred, but coeducation has been introduced with success in several public secondary schools. The programs in that case may be extended in time to lighten the work for girls. In 1907 a special examination for girls' schools was instituted, corresponding to the *Mellemskolexamen* and the *Realexamen.* Candidates for these examinations must be at least seventeen years of age, and schools wishing to have the right to prepare for the same must comprise at least six progressive classes.

The University and Professional Schools. — The higher institutions of learning in Denmark comprise the University of Copenhagen, the Institute of Technology, dental and pharmaceutical institutes, school of agriculture, and professional schools. First in rank of these institutions is the university, founded in 1475 by King Christian I. An intimate relation was maintained with Cologne, whence many of the early professors were drawn. The university was reorganized in 1539 under the direction of Johann Bugenhagen (*q.v.*), when Denmark turned to Lutheranism. In 1732 King Christian VI restored the university, which had been destroyed by fire three years earlier. In 1780 the scope of the university was enlarged, and the main features of the present organization date from that time. The university buildings are of comparatively recent construction, the old structure having been destroyed at the bombardment of the city in 1807. Under the direction of the university, or forming organic parts of it, are the hygienic, medical, and historical laboratories; the anatomical, mineralogical and zoölogical museums; the astronomical observatory, and the botanical gardens. The university, although under the general supervision of the Minister of Ecclesiastical Affairs and Public Instruction, enjoys a high degree of autonomy. The internal administration is vested in a university council (*Konsistorium*) consisting of sixteen members, including representatives of each of the faculties. The professors are appointed by the King upon the recommendation of the minister in advice with a committee of the university; they rank in the third class of the social hierarchy. The salaries range from 3600 kr. for assistant, to 6000 kr. for full professors. There are at present five faculties, as follows: theology, with five professors; law and political science, with eight professors; medicine, with fourteen professors; philosophy, with fifteen professors; and mathematics and natural science with eleven professors. Instruction is open to any one prepared to meet the entrance requirements, but the work is intended primarily for those who have passed through the Danish secondary schools. For the benefit of these students more than one hundred scholarships are offered. The number of students for 1906–1907 was: men, 1106, women, 59. The numbers for each faculty, as inferred from the entrance examinations, were as follows: theology, 34; law, 27; medicine, 48; philosophy, 435; mathematics and natural science, 602; graduate students, 19. As a center of scientific research the university enjoys high repute, and many important investigations are carried on by the professors. The discoveries of Meyer in medicine, Thomsen and Petersen in archæology, Lorenz in physics, and Thomsen in chemistry are noteworthy. Professors Höffding and Brandes of the present corps have gained wide recognition; the former by reason of his contributions to psychology and æsthetics, and the latter for his brilliant style and discriminating literary criticism.

Polytechnical Institute. — Scarcely inferior in rank to the university is the Polytechnical Institute. Established in 1829 with seven teachers for the training of chemists and mechanics, the school has grown and expanded until it includes all the courses usually given in the advanced schools of technology. There are twenty-four professors in the faculty, and a student body of about 550.

Professional Schools. — The dental and pharmaceutical institutes have about 200 students; the veterinary and agricultural high school over 500 students; schools of agriculture and gardening about 1200 students; the academy of fine arts, 200 students; conservatory of music, about 100 students; and the navigation schools, 175 students. Besides these there are a number of commercial schools of different grades, enrolling 4000 students.

Education of the Defective Classes. — The education of the blind, the deaf, and the feebleminded is under the supervision of the Minister of Ecclesiastical Affairs and Public Instruction. The success of the French schools for the blind and for deaf-mutes in the beginning of the nineteenth century awakened interest in Denmark; and in 1807 the first school for the deaf was established by the State at Copenhagen and instruction was made obligatory for the children thus afflicted. There are now two state schools and two private schools for deaf-mutes, with 400 students (1907). The first school for the blind was established in 1811. This school has at present a faculty of ten instructors and about a hundred students. Children are admitted at the age of ten, after having attended one of the two preparatory schools for the blind.

The State gives about 130,000 kr. a year for the support of the advanced school. The first school for the feeble-minded was established in 1855, as a private institution. There are now one boarding school with 200 pupils, one asylum with 110 children, and five asylums for feeble-minded adults.

Other Educational Agencies.— These consist of libraries, museums, and learned societies. Library facilities in Denmark are naturally best at Copenhagen. There the Royal Library is located, with a collection approximating 575,000 volumes, and the library of the university, with about 425,000 volumes. The latter makes a specialty of science, medicine, and technology, while the former is strongest in literature. There are more than 600 smaller libraries in the cities and towns of the provinces, with 345,000 volumes, and 800 children's libraries, with 40,000 volumes. There are also 400 small pedagogical libraries for teachers in the rural communes.

The Danish school museum was established in 1887, through the influence of the Society of Danish Scholars. It now has a well-selected pedagogical library, and aims to bring together books, material, and school appliances, for the enlightenment of teachers. (See MUSEUMS, EDUCATIONAL.)

Denmark contributes its full part to the intellectual activities of Europe, as is indicated by the number of its learned societies. The Danish Royal Academy of Science and Letters was founded in 1742. Its members, 150 in number, are chosen from the eminent scholars of Denmark and other countries. The Academy meets at stated intervals, offers prizes each year for meritorious work, publishes scientific memoirs, and proceedings of its meetings. It has an endowment fund (300,000 kr.) sufficient to meet the annual expenses. The Royal Antiquarian Society was founded in 1825 for the purpose of diffusing knowledge of the philology, ancient literature, and archæology of the North. The society encourages investigations and publishes the results of researches in the archæology and antiquities of Scandinavia. Its membership is large, and is not confined to Denmark. The society has an endowment of about 200,000 kr. Other notable societies are, The Danish Royal Society for National History and Language, founded in 1745; the Natural History Association, founded in 1833; the Royal Geographical Society, founded in 1876, which has a membership of 700 and publishes its own journal (*Geografisk Tidskrift*).

National interest in modern science is promoted by numerous additional societies and associations, each devoted to some one specific department of the natural and sociological sciences. Scientific knowledge is widely diffused throughout the kingdom by the system of free public lectures maintained by the university, in which every professor is expected to bear a part annually. The system of instruction carried out in the People's High Schools interests the rural population in the scientific principles underlying agricultural processes, and the result is seen in the constant increase in agricultural products, the great source of wealth to the kingdom. L. D. A. and A. T. S.

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DENOMINATE NUMBERS. — Numbers that have some unit of measure expressed are commonly known as denominate numbers. For example, 3 ft., 7 bu., $8, are denominate numbers. They are a special form of concrete number, the latter term being applied to any number that has a unit expressed, as 3 men, 4 trees, or 2½ ft. In all such cases, however, the number part is essentially abstract, and if we take the primitive notion of number, we should have to exclude concrete number entirely. The expression is, however, a convenient one in teaching, and should be retained. Denominate numbers are occasionally written as compound numbers (*q.v.*), as in 2 ft. 6 in. Textbooks frequently drop the term "Compound Number" (*q.v.*) entirely, this form of number having become less used of late years. The term "Denominate Number" suffices for educational purposes, namely, to furnish a title for the chapter dealing with the common tables of measure. D. E. S.

DENOTATION. — See MEANING; TERMS.

DENSTONE COLLEGE. — See COLLEGE; GRAMMAR SCHOOL, ENGLISH.

DENTAL EDUCATION. — In North America three factors have contributed to dental education; schools of dentistry, dental societies, and dental magazines. In no other country are schools so efficient, societies so numerous, and magazines so instructive, while the art of dentistry has become preëminent. This is due partly to the innate adaptability of the American character to a rapidly developing profession, and partly to environment. Whether the teeth of Americans are more prone to caries than those of other nationalities is a moot question, but it seems fair to assume that miscegenation, climatic influence, and the higher degree of civilization enjoyed by the middle and lower classes here have their influences. The science of dentistry is indebted to both European and American influences, the European contributions being in excess of those derived by the art of dentistry from that source.

Prior to 1839 a dental education, meager as it was, could only be obtained by the apprenticeship system, or by a similar arrangement between student and practitioner whereby the former, for a fee agreed upon, was given instruction for a specified term by the latter. Many practitioners would accept no students even on these terms, but jealously guarded the secrets of their offices from even the members of the profession. In 1839, the first dental college in the world, the Baltimore College of Dental Surgery, was established through the efforts of Horace H. Hayden and Chapin A. Harris, two Baltimore dentists, who had previously endeavored to persuade medical colleges in that city to establish dental departments, but without success. For several years previous to this, Hayden had taught classes of practitioners and students at his office, probably the first systematic dental teaching ever attempted. The Ohio College of Dental Surgery was founded in Cincinnati in 1845, the Pennsylvania College of Dental Surgery in Philadelphia in 1850, and the Philadelphia Dental College in 1863. From 1863 to date, a new college has been organized practically each year. In 1909 there were approximately eighty dental schools of all classes in the United States, of which approximately sixty were doing genuine and more or less effective teaching. Most of these are stock corporations; all are unendowed; a number are dental departments of medical colleges; seven are departments of state universities, namely, the state universities of California, Iowa, Maryland, Michigan, Minnesota, Pennsylvania, and Tennessee; and a score or more are departments of, or are affiliated with, various universities. Two schools, Meharry Dental College, Nashville, Tenn., and Howard University Dental College, Washington, D.C., are for negro students only. Practically all the progress made in dental education has been without a dollar in benefactions or endowments.

Prior to 1870 but few states had dental laws and boards of examiners. In 1910 every state in the Union had both. As various states passed dental laws providing for boards of examiners, and as these boards became more strict in their examinations, the demand for a dental education on the part of prospective applicants for registration became greater. Thus state laws were a potent factor in multiplying the number of colleges in the later years of the nineteenth century.

No specified preliminary education was required of applicants in the early decades of dental college life. The course in the Baltimore College of Dental Surgery for some years consisted of sessions of four months, beginning early in November and closing the latter part of February. Both theoretical and practical instruction was given, the first public dental infirmary being opened in 1846. The students were examined at the close of the course, and those showing unusual proficiency were graduated. Practitioners were also admitted to these examinations without previous attendance, and were graduated if found competent. This provision was in force in some colleges as late as 1870. The first advance in an educational way was to require students to attend two sessions unless they had been five years or more in active practice. In the latter case they were eligible to come up for final examination at the close of their first session. As late as 1880, this rule prevailed in many colleges, although the length of the session had quite generally been extended to five months, the preliminary educational requirement at that time being "a good English education." At this time, the course was not a graded one. The same lectures were given to both the first and second course students. The graded course was not generally adopted in the colleges until after the adoption of the three-session course, in 1890–1892, and as late as 1903–1904 students of at least one Eastern college were hearing the same course of lectures in each of three years.

The National Association of Dental Faculties, organized Aug. 4, 1884, whose membership for more than twenty years embraced practically all of the reputable dental colleges in the United States and Canada, has done more to raise the standard of dental education than any other one force, and especially as it secured uniformity in advancement. At its first session a resolution was adopted requiring two full courses of lectures in two separate years before students came up for graduation, thus doing away with a year's credit for experience gained in practice or in the office of a preceptor. A year's credit was given to the graduate in medicine. The minimum length of session was five months.

In 1887–1889 several valuable text-books were published as a result of the efforts of Faculty Association delegates. In 1891, the course was lengthened to three years of not less than five months each. The conferring of honorary degrees was discouraged by the

Association, and was absolutely prohibited in 1898. For some years after the three-year course was adopted, graduates in medicine, pharmacy, and veterinary medicine were granted one year's time credit. As regards pharmaceutical and veterinary graduates, this rule was abrogated in 1900. With the session of 1896–1897, the sessions were lengthened to not less than six months each. Beginning with the following session, a preliminary education conferring the right to entrance into the first year of high school was adopted. In 1898 this was advanced a year. In 1899 the length of the session was again increased, this time to seven months, and in 1901 a certificate of entrance into the third year of high school, or an equivalent education, was made the minimum preliminary requirement. A four-year course of seven-month sessions was inaugurated in the fall of 1903, but after a year's trial the schools returned to the three-year course, prescribing minimum sessions of thirty teaching weeks exclusive of holidays. At the session of 1908–1909 the session was lengthened to thirty-two weeks. At this session, also, the preliminary entrance requirement was raised to a certificate of entrance into the fourth year of high school, and at the session of 1910–1911, it was further advanced to a diploma from an accredited high school or equivalent credentials.

In 1909 the dental departments of the Universities of California, Iowa, Michigan, Pennsylvania, Harvard, and Minnesota organized a faculty association of their own.

The dental schools of Canada take high rank. All students, after graduation, are examined by provincial boards or by the Dominion Dental Council, representative of all provinces, this latter examination, if passed, conferring the right to practice anywhere in the Dominion. There are three schools in Canada, one at Toronto, one at Montreal, and one at Halifax. They are members of the National Association of Dental Faculties, and comply with its rules. In Mexico the only school, established in 1904, is a branch of the National School of Medicine.

There are several dental schools in England. Many of them are called "dental hospitals," and are public charities supported in part by civic appropriations. There are two schools in Paris, also. Germany, Norway, Sweden, Russia, and Italy each have their quota. Most of these are more or less intimately connected with the medical profession and medical schools, and in none of them is the technical aspect of training to be compared with that of schools in America. G. E. H.

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DENTISTS IN THE SCHOOL. — See Teeth, Hygiene of.

DENTITION. — See Teeth.

DENVER, UNIVERSITY OF, DENVER, COL. — Founded in 1864 as the Colorado Seminary, developing in 1880 into the University of Denver. A preparatory school, college of liberal arts, graduate school, college law, music, a school of commerce, and a teachers' college are maintained. Candidates for degrees in the college of liberal arts must have had a high school course, and fifteen units are required for entrance into the freshman class. The usual college courses leading to the degree of Bachelor of Arts are offered. There is a faculty of fifty-five professors, and twelve instructors.

DENZEL, BERNHARD GOTTLIEB (1773–1838). — A prominent German educator of the Pestalozzian school. Born in Stuttgart, he studied theology at the University of Tübingen, and then took a position as a private tutor in Frankfurt-on-the-Main. From there he went to Yverdun and became an enthusiastic disciple of Pestalozzi. In 1811 he was appointed rector of the first Würtemberg teachers' seminary at Esslingen, which position he filled to his death. Denzel was one of the first German teachers to formulate the true conception of the *Volksschule* (Public School) as a common educational institution which is to prepare the pupil for life as a man and as a member of society, without regard to any special vocation. He defines education as "the harmonious development of the physical, intellectual, and moral faculties." He also did valuable work in regard to special methodology in the elementary school. His chief writings are *Die Volksschule, ein methodologischer Lehrkursus* (*the Public School, a Course in Methodology,* Stuttgart, 1817), and *Einleitung in die Erziehungs- und Unterrichtslehre für Volksschullehrer* (*Introduction to the Theory of Education and Instruction for Elementary School Teachers*) in four volumes, 1820. F. M.

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DEPARTMENT OF SUPERINTENDENCE. — In 1865, at a session of the National Teachers' Association (*q.v.*), there was held a special meeting of state and city superintendents. This meeting decided to hold in February, 1866, another meeting for the purpose of forming a National Association of School Superintendents. The early work of this association was effective in procuring the organization of the National Bureau of Education. In 1871, when the National Teachers' Association became the National Educational

Association, there was organized as its first department that of School Superintendence, absorbing the National Association of School Superintendents before alluded to. For the first twenty years thereafter the department held one meeting each year with the National Education Association, but up to 1890 its most important meetings were held in the winter time, and with one or two exceptions in the city of Washington. Since 1890 the winter meeting has become much larger and has been more frequently held in the Middle West. This has assumed the character of a midyear meeting of the National Education Association. Since 1890 the department has elected its own officers at the winter meeting.

A list of the papers presented shows that such subjects as statistics, supervision, school organization, rural schools, manual training, and national aid to education have been prominent, although a great variety of other subjects have claimed attention. For twenty years after 1870 the organization devoted itself partly to establishing the National Bureau of Education, and partly to carrying on a campaign for national aid to the public schools. In the former it was successful, but the latter has ceased to be a live issue. In the field of statistics and reports the department was able to procure some uniformity, but no extensive adoption of more perfect methods of record and report.

See National Education Association.

Reference: —

Report of Nat. Education Assoc., 1901, pp. 227 to 236; 1906, pp. 516 and 576.

DEPARTMENTAL SYSTEM. — A system of school administration by which classes are assigned to different teachers for instruction in different subjects. The system is in practice in college education, and very largely in the high schools. As an administrative question, it gained its importance from the proposal to adapt it to elementary schools, at any rate in some grades. The plan differs from the employment of special teachers in that the teachers are permanently attached to the school staff and do not go round from school to school. While numerous advantages are claimed for the system, as many objections can be brought against it. It is thought that the teacher who instructs in but one or two subjects must become an expert in those subjects with all the enthusiasm and inspiration of a specialist, with the result that improvement in instruction follows. The presence of one teacher for one subject during several years insures continuity of the course, while the teaching of different subjects by different teachers secures variety of approach and contact with several types of mind, at the same time annulling the evil effects of the influence of a bad teacher. It is also claimed that teachers prefer to specialize along lines of their own interests, that the scope of each subject as taught by a specialist is intensified and broadened, and that a pupil's ability along certain branches can easily be detected and encouraged.

The objections, on the other hand, are that the system leads to overwork, for each teacher sets a higher value on her own subject than on the others; that specialization in a subject is narrowing, and that particularly when taught only to the extent required in the grades; that expert knowledge is no guarantee of improved teaching ability; that the system interferes with the proper correlation of subjects and general all-round development; and lastly, that the pupils lack the controlling influence of one teacher and all that that means for them.

The departmental system is at bottom an attempt to apply a plan, which has approved itself in college and has been employed, perhaps not altogether successfully, in high schools, to conditions of elementary schools. It is based on the mistaken notions that children attend school in order primarily to obtain information in a number of subjects, and that the existing system of dividing school work into so many hours of this or that subject is ideal. The departmental system would further intensify the breach in that continuity of experience which is essential to the best development of the child. Unity of interest cannot be maintained with young children in the grades by dissipating their attention among many teachers, and the personal influence of one teacher is essential in school life.

A case may perhaps be made out for the employment of the system in the two highest grades, but only on the plea that in this way can the gap between the elementary and high schools be bridged. But the assignment of pupils to one class teacher must be retained even under this system. Such a class teacher would perform the functions of a housemaster in the English boarding school, or the preceptor at Princeton; he would be responsible for the attendance, good conduct, high standards of work, and general welfare of the pupils assigned to him. At the same time such a teacher might have charge of several school subjects. A system of this kind would, of course, be applicable, and is no doubt essential, to the high school.

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DE PAUW UNIVERSITY, GREENCASTLE, IND. — A coeducational institution, chartered by the legislature of Indiana, Jan. 10, 1837, as the Indiana Asbury University, in honor of Francis Asbury, the pioneer bishop of the Methodist Episcopal Church. Until 1883, the institution met, on the whole, with success, but in that year its existence was seriously threatened by lack of funds, when M. De Pauw gave the university sums at various times which, as afterwards added to by members of his family, amounted to $600,000. In 1884, the corporate title was changed to De Pauw University. The government of the university is vested in a Joint Board of Trustees and Visitors; twenty-one out of the thirty trustees are elected by the Indiana Conferences of the Methodist Episcopal Church.

In organization the institution is a college rather than a university. It maintains an undergraduate college, known as the Asbury College of Liberal Arts, admission to which is by examination or certificate from a "commissioned" high school (see ACCREDITED HIGH SCHOOLS); a school of music, which confers the degree of Bachelor of Music, and also admits students without examination to partial courses; a school of art, which confers the degree of B.P. (Bachelor of Painting) upon the satisfactory completion of a course combining studies in both Fine Arts and Liberal Arts, and a preparatory school, known as the Greencastle Academy. De Pauw is distinctly a denominational college, and the religious interests of the students are carefully fostered.

The university grounds are divided into six separate campuses of from three to eight acres each, situated near the center of Greencastle. Grounds, buildings, and equipment were valued (1910) at $475,000, of which sum $85,000 is the value of dormitories and residences. The total annual income is $86,000. The average salary of a professor is $1700. The number of students in 1910–11 was 1053. The instructing staff numbers forty-one. C. G.

DEPORTMENT AND WEATHER. — Human behavior is affected by all kinds of changes in the physical environment. It has been shown by statistical examination that crime and misdemeanors of every order vary with the conditions of the weather. Thus, when there is extreme heat, to which human beings adjust themselves with great difficulty, there are likely to be many forms of depression and behavior corresponding to this mental abnormality. When the atmospheric conditions are such as to stimulate the nervous system, certain forms of excitement appear. Thus it has been shown that a high wind is likely to affect unfavorably the behavior of school children. Some inquiries into school deportment seem to indicate the very general relation between such deportment and changes in the weather. Certainly weather conditions which produce exhaustion or fatigue or lassitude affect the general school work and indirectly the discipline of the school.

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DEPOSIT FUND, UNITED STATES. — See SURPLUS FUND OF 1837.

DEPRESSION, MENTAL. — See MELANCHOLIA.

DEPTH. — The recognition of the distance of an object away from the observer is a problem of special importance in psychology. (See BINOCULAR VISION; SPACE.) This recognition involves an elaborate form of fusion of the images received through the two eyes. It has consequently been one of the crucial topics in experimental psychology and in general theoretical psychology.

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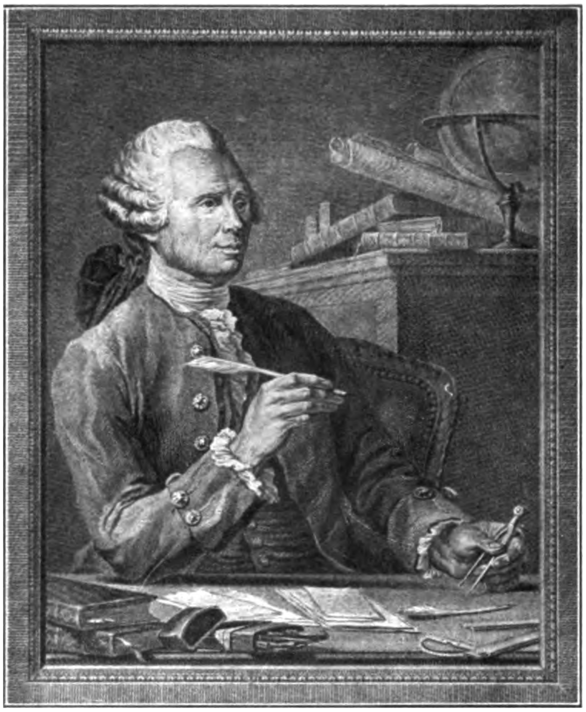
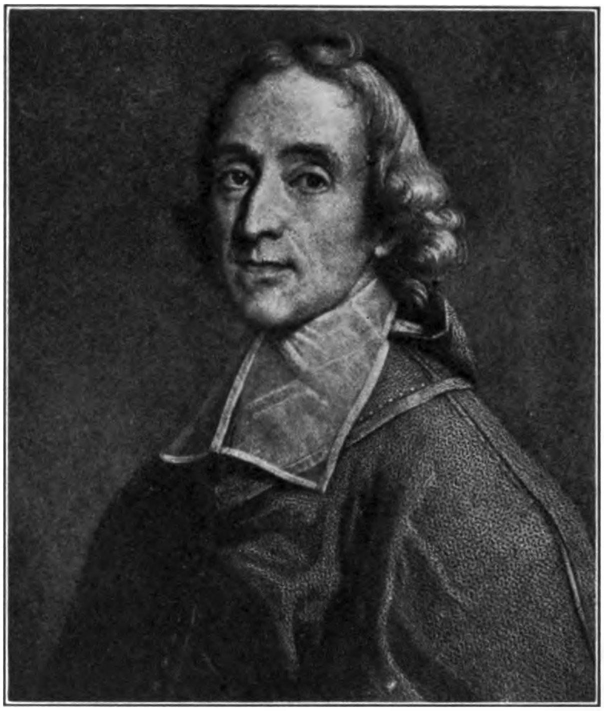
DERANGEMENT, MENTAL. — A general term to include all abnormalities in the mental life of the individual, whether of sufficient intensity and duration to be called insanity, or of so mild and temporary a character as, sometimes, to be unnoticed by friends and relatives. The more or less permanent forms of derangement will be discussed under the topic INSANITY (*q.v.*). Temporary derangements are to be found associated with many diseases not usually classed among those of a mental character. The dreamlike states in epilepsy, the mental hebetude accompanying and following many diseases of the internal organs, the mild deliria of short duration, the brief periods of confusion accompanying physical exhaustion, and certain amnesias are derangements of a mental order, but often they are not sufficiently pronounced nor of sufficient duration to be classed with the insanities. S. I. F.

DE SAINT-BONIFACE COLLEGE, WINNIPEG, MANITOBA. — See JESUS, SOCIETY OF, EDUCATIONAL WORK OF.

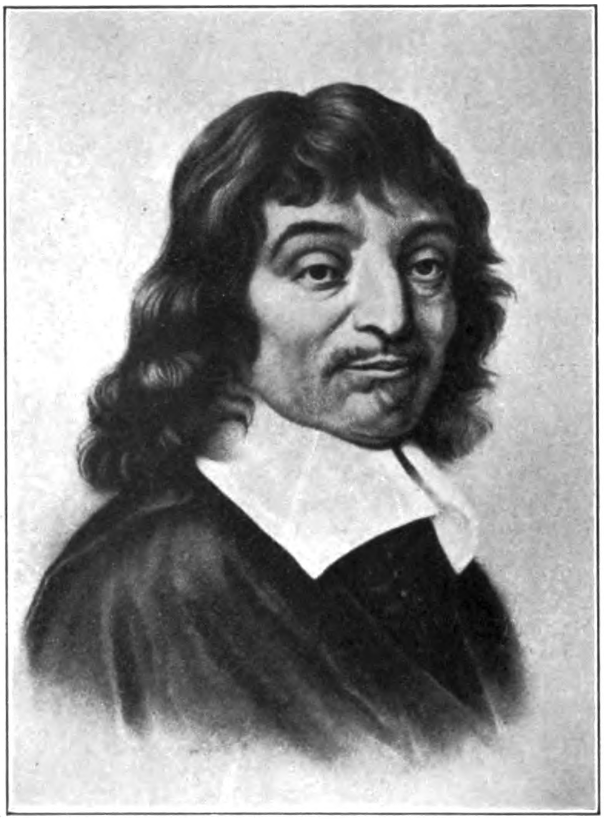
DESCARTES, RENÉ. — The celebrated philosopher, mathematician, and physicist; born at La Haye, France, Mar. 31, 1596, and died in Stockholm, Sweden, Feb. 11, 1650. At the age of eight years he entered the new college at La Flèche, a leading school for the education of the nobility, which was under the direction of the Jesuit Fathers. Here for over eight years he received special care for his physical growth, and the best mental training then available. Mathematics seems to have interested him greatly at this early age, and thus exercised the influence over his mind which was to reconstruct the whole modern realm of thought. The first two years of freedom from school were spent in Paris. After two years devoted to further study, he passed four years as a volunteer in the armies of the Netherlands and of Germany. His reflections began now to formu-



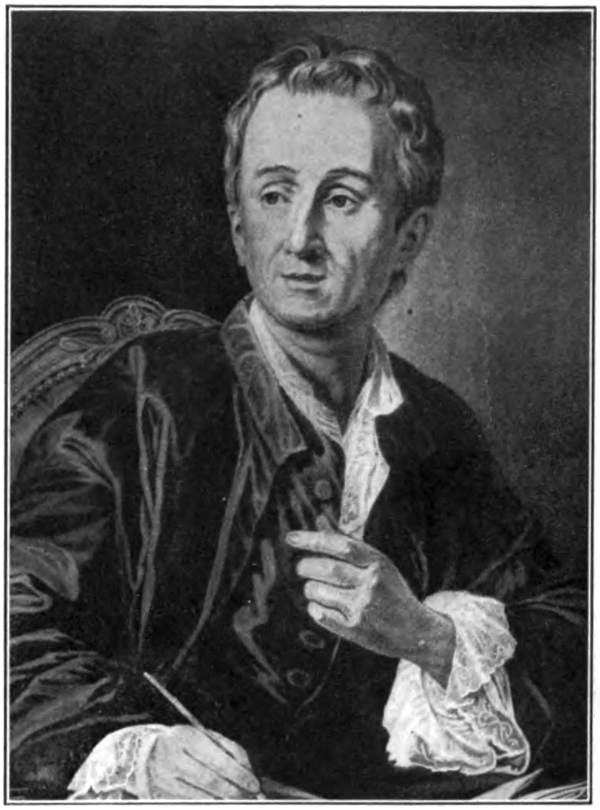
Jean le Rond d'Alembert (1717–1783).
See p. 245.



François de Salignac de Lamothe Fénelon (1651–1715).
See p. 597.



René Descartes (1596–1650).
See p. 306.



Denis Diderot (1713–1784).
See p. 336.

A GROUP OF LEADERS IN FRENCH EDUCATIONAL THOUGHT.

late themselves in the *Rules for the Direction of the Mind* (probably written 1629, published 1701). In his search for true knowledge he learned that doubt is essential to belief. Desiring quietude to carry on his new way of thinking, and seeking also, doubtless, escape from the vigilant eye of the Church, he secretly retired to Holland, the place of safety and of liberty. Here for twenty years he reflected and produced the works which established his place in history as the "father of modern philosophy" and started those intellectual influences which have continued to be vitalizing down to this day. In 1646 the charge of atheism was brought against him by a Protestant theologian, and the controversy that followed was characteristic of the times. Some time later receiving an invitation from Queen Christina of Sweden to visit Stockholm to expound to her his system of philosophy, he arrived in that city in October, 1649. The severity of the far northern winter climate and the changed mode of life hastened his death. Shortly before his death he handed the Queen the plans for an Academy of Sciences which he had been requested to prepare. In 1666 his remains were taken to France.

Des Cartes' best known work was a collection of "essays," published anonymously at Leyden in 1637. It contained the *Discourse on the Method of Rightly Conducting the Reason and Seeking Truth in the Sciences*, the *Dioptric*, the *Meteors*, and the *Geometry*. The last three were instances of results obtainable by a use of the method described in the first essay. The *Discourse* was written in French, and with such unusual clearness that it appealed at once to the learned and the common people. In 1641 he published in Latin the *Meditations on the First Philosophy* (in which the existence of God, and the real distinction of mind and body, are demonstrated. His most systematic work, *The Principles of. Philosophy*, appeared in 1644. The *Treatise on the Passions of the Soul*, appearing in 1649, was the last of his works published during his lifetime. In this he attempts to show how the emotions are due to the union of body and soul, in connection with the action of the "animal spirits." The work on *The World, or Treatise on Light*, which he suppressed, as he did not wish to publish "the least word which would be disapproved by the church," finally appeared in 1664.

Des Cartes' contributions to knowledge extend over several domains. His high regard for the mathematical type of knowledge, already shown in his relation to analytical geometry, led him to endeavor to make its method the true method of philosophy. As a physicist he contributed to the theory of refraction of light, the explanation of the rainbow, and an estimation of the weight of the air. The origin of all cosmic bodies he suggested might be found in a primitive state of motion. He carried out observations in anatomy. His ability in psychological observations, coupled with his keen analysis of the "natural" logic of mind, practically provided him with the cornerstones of his theory of the sciences and his system of philosophy. In addition to these services, whereby marked changes were in time effected in the subject matter that was taught in the higher schools, his life and thought became significant for education, inasmuch as they presented a clear and convincing realistic and philosophical opposition against the regnant system of tradition and hierarchism. In becoming a spokesman for the newer spirit of his age, he at the same time pointed out the direction which the coming ages were to take.

The beginning of the seventeenth century found Europe changing from the long-established scheme of authority over thought and action to individualism. Luther, Bacon, and Comenius had done much to hasten the movement. But it was left to Des Cartes to give a philosophy to this newer point of view and its human possibilities. This philosophy was thought coming to a knowledge of itself. Man lives in a world which is capable of rational interpretation. Freeing the mind from all presuppositions is established as a principle, and the attainment of self-evidence is set up as the goal. In order to eliminate the uncertainty of knowledge, Des Cartes courageously applies the method of universal skepticism. At last he discovers that one's own existence is certain because existence is necessary for one to think or to doubt. Thus he arrives at his famous conclusion: *Cogito, ergo sum.* This formula and the experience upon which it is based resists all doubt. Upon this he proceeds to build up a system of knowledge.

Des Cartes' importance in the history of education and its theory rests upon several facts. Every distinct philosophical conception has potential bearing upon a system of education. He is one of the first of the moderns whose careers reveal the compelling force emanating in a logical manner from philosophy and modifying later educational interest and activity. Also the principles of the method upon which his philosophy rests have direct bearing upon the problem of education. And, finally, being one of the best trained men of his day, his writings, which are more or less autobiographical, supply some information as to the state of education in his time, and his opinions on points in educational values come to have great weight. It should also be noted that he made no direct contribution to the literature of education, and did not undertake a solution of its more immediate problems as such. The reforms which his work helped to introduce became all the more significant, probably, just because he did not work as a teacher in the schools, but as one seeking the essential and universal elements in human nature.

The first part of the *Discourse on Method* has been rightly called "a chapter in pedagogy." As an autobiography it has a permanent place in the important literature of education. The statement of his views on the educational values of school subjects really forms the preface to the application of his philosophical method to the problem of knowledge. The special aim of the latter was to make good the deficiencies which resulted from schooling in the different kinds of knowledge that were available at that time. It was their limitations that urged him to discover a method of reasoning, unknown in the books and the schools, which should become a source of certain, positive, and genuine knowledge, useful for the purposes of life. He demanded that education in practice should cease abusing literary and historical knowledge.

Des Cartes' influence upon pedagogy, especially in French schools during the latter part of the seventeenth century, was very marked. In a positive way, the practice in the Oratory (*q.v.*) and the Port-Royal schools (*q.v.*) showed a direct influence of his method and theories. In higher education one of the effects of his philosophy was the overthrow of scholasticism and the elimination of Aristotle from the seminaries and universities. Admitting that the syllogism had a value for the dialectical training of a young mind, he denied its supposed function as a means of getting new knowledge. As an experimentalist — using this term not too strictly — he did much to establish effectually the later realistic study of things. In a negative way, his relation to the pedagogy and the philosophy of the Jesuits is just as interesting. Educated in his youth by them, he later came to condemn their type of education. They, in turn, rejected his philosophy and condemned the Oratorians for teaching it.

His chief significance, however, is to be found in the influence his achievements exerted in reconstructing educational theory, and in the suggestion some of his ideas contributed toward the formulation of a number of educational principles. In establishing the distinction between the mind and the body, he exalted the former to such a degree that its discipline was made the end of all study. His view of innate ideas and of the innate faculties of the soul determined the measure of all educational means. The supreme importance of training the individual followed directly from his philosophical rejection of the principle of authority in knowledge, in place of which he advocated the principle of evidence and free examination. The appeal to reason as the criterion, and to inquiry as the means, of true knowledge led to the principle of individual liberty. The true end of mental interest and activity is, not erudition, but real knowledge. He announced the doctrine of the native equality of all minds. "Good sense is, of all things among men, the most equally distributed." "The power of judging aright and of distinguishing truth from error, is by nature equal in all men." The inequalities actually found among minds have their origin in education and the variety of culture, although he admits repeatedly, that there are original differences in mental capacity; some minds work more rapidly, others more slowly; some are more original than others. But nature is not enough. Education must come in to supplement and direct it, so far as the mind is concerned. "To be possessed of a vigorous mind is not enough; the prime requisite is rightly to apply it." Education is therefore possible for every individual. It is democratized by being shown to be, not a privilege, but a natural right. From this it was but a step to the position which declared that each one has the right to think for himself. This is a demand that each mind is to be trained in thinking by handling facts at first hand. The routine learning and mechanical memorizing must be superseded, for it is reason that naturally thinks and knows truth when it is unhampered by words or other external authority and proceeds by means of the method of the natural logic imbedded in its nature. The goal of clear thinking based on evidences becomes a pedagogical ideal. Des Cartes was probably the first to lay down as a principle the demand that the order of acquiring knowledge shall follow the natural order of mental activity. He explicitly stated that the mind proceeds from the known to the unknown, from the simple to the complex, from the easy to the more difficult. This order he applied to the adult in the pursuit of science; but, by implication, the method is even more important for the young mind just beginning to learn to think.

These principles of education appeared not by implication from his philosophical system nor its long influential history on the Continent, but were set forth in the rules he wrote out for the constant guidance of his own thinking. They constituted the *Rules for the Direction of the Mind*, and were summarized in the second part of the *Discourse on Method.* The former unfinished work was to have contained thirty-six rules, but only twenty-one were written out. They give his best statement of the "natural" logic he discovered. How directly modern pedagogy is indebted to Des Cartes for some of its principles may be seen in some of the *Rules* (Torrey, pp. 61 ff.).

(For portrait, see opp. p. 307.) E. F. B.

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DESCRIPTION, RHETORICAL. — See Composition.

DESIGN. — As related to the arts, design usually implies the planning of the form, structure, and decoration of objects so that they shall satisfy utilitarian and æsthetic demands. The degree to which an object fulfills these demands determines the excellence of its design. The conditions which meet the utilitarian demands are obvious, namely, that the object shall adequately fulfill its purpose. The æsthetic demands are more complex, and generally include utility and the beauty which results from pleasing proportions and outlines, appropriate treatment of material, and suitable decoration.

Industrial Design. — In the constructive arts the utilitarian demand has first to be considered. Until this is met as completely as possible, it is difficult to find in ornamentation any permanent enjoyment which at all compensates for the dissatisfaction arising from imperfect fulfillment of purpose. Attempts to beautify inadequately planned or constructed objects by profuse decoration give an impression of effort misdirected. For example, a chair which is uncomfortable is poor in design. Expensiveness of material and richness of ornament or technical excellence of construction cannot compensate for failure to fulfill the function of a chair, a failure which prevents lasting pleasure in whatever formal beauty may appear in the details. Closely related to this utilitarian consideration is the pleasure in fine craftsmanship which is not content with a crude construction barely sufficient to meet the needs, but which demands also a mastery of tools and processes. The satisfaction that arises from the contemplation of an object which adequately fulfills its purpose and is well constructed readily transcends the crude stage of relief because a need is met, and develops into pleasurable appreciation of the fact that intelligence has shaped raw material into an effective creation by means of clear understanding of its purpose and perfect mastery of the materials. This contemplative appreciation of a well-constructed object which perfectly fulfills its purpose is an æsthetic satisfaction, and thus in industrial products, utility and excellence of workmanship appear as the primary elements of good design.

Design in the Fine Arts. — The conditions which satisfy the æsthetic demands for formal beauty appear to be as follows. Beauty of proportions and outline is one of the chief requisites. Experimentation with the possibilities of different relations of proportions and areas, for example in placing a given number of windows in the front of a house or determining the position of a title to be printed upon a book cover, shows some positions to be so much more pleasing than others that they lead to a definite choice. An analysis of the results generally discovers a consistent though not monotonous interrelation of measures in the case of the pleasing proportions. Experimentation with curves shows also that some give greater pleasure than others, and that in the most pleasing forms the variations of curvature are consistently related. Thus the standards of excellence in proportions and outlines appear to be based not upon fashion, but upon universal and permanent reasons. An understanding of the mathematical nature of the relations of measures upon which good proportions and curves depend is not necessary to an æsthetic enjoyment of these forms. One may become trained to discriminate almost unerringly between fine proportions and those that are commonplace, without knowing why the results are pleasing, or that any calculable relation exists. The response appears to be immediate in terms of enjoyment, and the adjectives "good" and "bad" as used by the designer with regard to proportions and curves are meaningless except in terms of pleasure awakened.

After the demand for utility has been met, the next important condition of excellent design is this of good proportions and fine outline. The opportunities offered by the arrangement and refinement of necessary parts of the structure itself should be utilized to the full before ornament is added, for in placing and shaping of essential features lies the greatest possibility for beauty. For example, in the instance of the chair which has been so planned as to fulfill all the demands of utility such as strength and comfort, there is abundant opportunity, without transgressing these, to vary the position of braces and panels and the shape of the back and arms and legs so that pleasing proportions shall result. These same essential parts may also be so modified as to give the chair a consistent character throughout. It may be solid and heavy, or light and delicate, and yet still outlined by straight lines, or it may repeat curves of a particular sort. When the interest of a skilled and artistic workman continues beyond the satisfaction of utilitarian demands, and he lingers over his work, experimenting with its proportions and outlines till they show the same character throughout, the object gains an individuality which is the basis of style. When the object is one of a kind which the builder repeats indefinitely, he is able to embody in each successive product the hints gained by previous experiments, and gradually to perfect a type. Where many artisans are at work in the same line, a still more thorough exploration of the possibilities of a given theme occurs. Thus styles of architecture, furniture, metal work, etc., have developed.

The same interest that leads to utilizing to the full the possibilities of beauty in the proportions and outlines of the necessary structural elements frequently influences the artistic craftsman to carry the manipulation of his product still further, by playing with and echoing its nature and structural features by such treatment as calls forth the beauty of the materials, for example, the grain or polish of wood and the color or texture of metal, sometimes making even the tool marks a decorative feature, as in hammered metal or carved wood. This interest finds expression also in ornamentation which emphasizes and perfects the style, or symbolizes the history, use, or surroundings of the object. Such ornament is not an accidental or unrelated addition to an object, but an essential expression and organic part of it. Such decoration as this is clearly differentiated from that sort of ornamentation which results from inability to respond to the stimulus of a perfected idea and which therefore depends upon the barbaric love of heterogeneous collections unorganized by any dominating thought, resulting in a competition of interests. Good design in ornament is not assured by mere technical excellence. For example, an Indian's head may be realistically painted upon a vase, but neither has any organic relation to the other, and neither enhances the beauty of the other. They are competing artistic interests accidentally juxtaposed, and therefore poor in design.

Good industrial design demands that an object adequately fulfill its purpose, that its workmanship be skillful and its construction sincere, that the possibilities of beauty in the materials and in orderly and consistent arrangement and shape of necessary parts be utilized to the full, and that ornament where used shall be a fulfillment or reënforcement of the idea of the object.

Relation of Design to the Arts of Representation. — In painting and sculpture, the utilitarian demand is not so evident as in the industrial arts, but is still a prominent element of excellence. The mural painting should primarily be a painting designed for the wall in a sense that is not fulfilled by merely suiting its dimensions to those of the wall and its subject to the surroundings. The technical treatment, the qualities of color, and the disposition of lines and areas must conform to the mural idea. Even the apparently independent easel picture is not at best advantage, if it must be made with no regard for its permanent location. Statuary is usually required to be an integral part of an architectural or landscape setting. Some correspondence exists between the subject of a painting or piece of sculpture which determines the kind of response it seeks to awaken, and the utilitarian purpose of an article of industrial art. The appropriate purposes of arts of design are those which cannot be so well accomplished by literature or music, and are those which depend for their effect not only upon what things are represented, but largely upon such an arrangement of them as shall result in the formal beauty of consistently related areas, balanced masses, pleasing flow of line, and harmonious color. The artist must be sufficiently master of his facts to justify his courage and be convincing when he uses natural material for his own creations, but he must also understand design, or his creation will lack the quality which justifies a modification of facts as presented by nature and distinguishes a work of art from a photograph or cast from nature, namely, that a work of art is the embodiment of a human idea.

Place of Design in Education. — The purpose of a study of design in education is to develop the desire and capacity to enjoy beautiful things, to establish standards of taste, to raise the æsthetic sense from the level of response only to those accidental stimuli which are powerful enough to arrest and hold attention without effort, to an appreciation of what gives increasing pleasure because of elements that are permanent and universal. Such training should result in new sources of enjoyment for the individual, and in a higher standard of industrial products. The production of a great amount of raw material is not so valuable an outcome of civilization as the ability to convert raw material into the highest grade of finished product.

Present School Conditions. — Design has a large place in the elementary and secondary schools of nearly all countries prominent in education. Individual towns and cities, even in the same country, often vary greatly in their methods, but perhaps the most significant and general difference in methods in the United States as compared with other countries is that in the schools of the United States the chief emphasis is usually laid upon the exercise of originality from the earliest years, while in most other countries a broad acquaintance with the best design of the past and a thorough training in drawing from nature and historic ornament is generally insisted upon as a necessary foundation for originality. In the schools of the United States design has in the past been largely in the field of ornament worked out according to the principles of formal beauty, and used, if at all, as decoration applied to completed objects. Probably this has been true because design has been taught so frequently by a department having no organic relation with that which has taught constructive work. On this account the teachers of construction have emphasized the phase of design relating to utility and technique, while the teachers of art have given chief attention to that relating to the formal beauty of isolated shapes. Under these circumstances the relation of ornament to structure and that other important phase of design, namely the possibilities for beauty that lie in the disposition of structural parts even where no decoration is used, have often been overlooked. The study of unrelated principles of formal beauty however, is gradually giving way to an acquaintance with concrete problems which embody all phases of design and offer opportunity to give to each the consideration warranted by its relative value.

The study of design usually begins in the lowest grades and continues through the high and normal schools. The problems are increasingly those related to actual conditions in school, home, and community. The lines of study may be generalized as follows. A consideration of the utilitarian conditions which the problem must meet, experimentation with the forms involved, to discover the best shapes and arrangement, appropriate ornamentation in form and color, and study of the best available examples. The phases of design which emphasize simple decoration with repeated forms as in borders and surface patterns are considered as best adapted for the youngest children. Those which call for original judgment as to utility and formal beauty and harmonious color demand increased maturity.

In England and in the leading European countries emphasis is laid upon the relation of the arts of design to the industries of the country. The present trend appears to be toward developing originality in design. The directing idea underlying this tendency is that design develops best not when the mind depends largely upon its spontaneous activity, but when it is furnished with the widest possible knowledge as a fund of suggestion. The acquaintance with the best examples and the training in drawing as a means of securing data is much more thorough than in the United States, and design is more intimately related to the industries of the country. The British and European attitude toward the teaching of design is suggested in the definitions of its purpose made by the British Department of Practical Art in 1852, which have not been departed from, and which are practically true for European countries. (1) General elementary instruction in art as a branch of national education among all classes of the community, with the view of laying a foundation for correct judgment both in the consumer and the producer of manufactures. (2) Appreciation of the principles of technical art to the improvement of manufactures, together with the establishment of museums by which all classes might be induced to investigate those common principles of taste which may be traced to the works of excellence in all ages. W. S.

See Art in the Schools; Art, Methods of Teaching; Art Schools; Drawing; Museums; etc.

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DESIRE. — The mental state which precedes voluntary effort on the part of an individual. Desire grows out of apprehension of some object which is needed in the individual's life, either for purposes of self-maintenance or purposes of pleasure. An individual's desires may be regarded as indicative of the individual's present training and general adaptation to his surroundings. On the relation of desire to behavior see article on Will.

DESKS AND SEATS, SCHOOL. — If the education of children within the schools were carried on in a strictly rational manner, the problems growing out of improper school desks would be reduced very materially. If the school work were organized around the various lines of activity within the range of the capability and delights of the children, there would be no need for almost constant sitting, with the result that most of the dangers due to habitual abnormal posture would disappear. But good school desks would be necessary even under conditions of ideal school activity, and under the present sit-read-and-write scheme, they are of very great importance. There are certain requirements for satisfactory school desks well understood by all intelligent teachers, and in the main, the best desks now on the market are constructed in accordance with these requirements. There are certain other demands, however, not yet generally understood by teachers, and accordingly there are no desks on the market embodying some essential hygienic features. Progress toward better school desks has been made, just as progress in all lines of school work. First a clearer appreciation of what is needed has come, and then the eagerness for accomplishment which invariably accompanies such recognition.

The hygienic requirements of thoroughly satisfactory school desks may be stated as follows: —

1. The seat should be disconnected from the desk in front, and also from the one immediately behind. The reasons for this demand are in the main self-evident. This arrangement gives perfect freedom for adjusting the pupil to his seat as well as to his desk, without in any way disturbing a similar adjustment for the pupil next in front or behind. There are often great differences in height between pupils in the same grade or section, and proper classification cannot be made without frequently seating those who thus differ in height and size in adjacent parts of the room and even in the same row. In the next place, when desks and seats are thus disconnected, the uneasy movements of one pupil in his seat do not disturb the work of his neighbors. This gives an ad-

vantage in school management not to be overlooked. Furthermore it enables the teacher to hold each pupil responsible for the care of his desk and in this way to inculcate habits of neatness and conscientious care of public property, a lesson in real civics which ought to be of vital interest to all concerned.

2. The seat should be readily and easily adjusted to suit the height of the child, and this adjustment should neither disarrange nor disproportion the form of the seat board nor the back of the seat. It took almost a century of observation and effort on the part of teachers of our public schools to get those whose duty it was to build schoolhouses and to furnish them to see the need of making the seats fit the pupils instead of trying to make the children adapt themselves to the benches. It was a common thing fifty years ago to see school children suspended throughout the school session on benches so high that their feet could not touch the floor. Even to-day those who make school benches and those who buy them scarcely realize the urgent need of desks easily and readily adjustable to each child in attendance. Not a few of the modern desks, which are adjustable as to the height of the seat, are poorly constructed with reference to the adjustment of the height and shape of the back rest. It stands to reason that as children grow the back rest should be adjusted to conform to the changing form of the body, if children are to do their work with the least fatigue and without malformation of their bodies. In this connection the attention of the reader ought to be called to the fact that during the adolescent period of a girl's development, the diameters of the pelvis are rapidly changing, the small of the back, when sitting, is higher from the seat board, and hence frequent adjustment of the back rest is necessary. Who has not seen the well-developed young girl in high school attempt to relieve the strain of long-continued sitting on poorly adapted benches by putting a book against the small of her back? The typewriter chair, with its sliding block on the back rest, illustrates what a restful seat demands, and should be copied in some form in all school seats, especially those designed for well-developed girls. A seat may continue to be the proper height from the floor, while the back rest may require frequent shifting. It is a matter of congratulation that this special need of the girls has been noticed by certain school authorities and steps taken to supply the deficiency. In the *Annual Report* of the Schoolhouse Department of the Boston Public Schools, for 1905–1906, there is a discussion of this point, from which is quoted the following: "The designs for the two forms of seat backs now in actual use were developed to meet what a careful testing of individuals showed to be the average lumbar spine curves in children of primary and grammar school age. As time went on, and these models came into actual use for hundreds of scholars, it became obvious that one factor had not been sufficiently considered, namely, the change in pelvic and lumbar curves in certain girls at, and beyond, the age of puberty. There is, of course, at this age a marked physiological and anatomic change. The boy changes in size only, the girl in shape as well; and no change in height adjustment can make it practicable to fit male and female scholars with any single form of back rest when once the females have undergone this change. . . . After a good deal of trial and experiment, a model has been evolved which seems to meet all these requirements adequately. The points to be considered are that the girl of the given age, thirteen to fifteen, or thereabouts, may, in certain instances show: An increased breadth of hips; and an increased height from seat to waist, due not to bone change, but to the increase of fatty tissue in the gluteal region (and incidentally to the increased bulk of clothing that comes with the assumption of adult styles). It is not in all cases that these changes occur. Even with the completion of the changes of this period, many mature and normal girls show little of this special change in curves, but the minority who do show such a change must be comfortably accommodated, and for this reason this new seat-back has been designed, showing the following modifications: (*a*) An increase in the lumbar curve in the anterio-posterior plane. (*b*) An incease in the maximum height to which the back may be adjusted. (*c*) A broadening of the curves of the seat as a whole. (*d*) A flattening of the lower curve corresponding to the maximum breadth of hips." (See *Report* of Schoolhouse Department, 1906, pp. 86–87.)

It is not safe to depend on supplying the proper height of seats to all the pupils in an ordinary schoolroom, especially to the grammar grade, by relying on the manufacturers to furnish several sizes or numbers. The practical outcome of the discussion on this topic ought to be this: Every child has a right to demand a school seat adjusted to his individual height and form, and it is the duty of the authorities to supply it, and that of the teacher to adjust it. If this is not done, ill effects, both physical and mental, may certainly be expected.

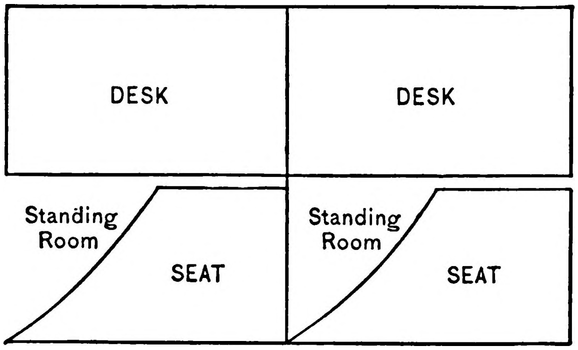
3. The back of the seat should be just high enough to support the back of the pupil, when sitting erect, from the shoulder blades downward, and should be made to conform to the natural curve of that part of the back. There are very few school seats on the market not too high in the back, and fewer still whose backs have the proper curve, or the means of adapting them to the proper curve.

4. The seat should be in the form of a chair with no side arms, and the seat board ought to slope gently from about two inches from the front toward the back, so that at its back it would be from one half inch to an inch lower than in front. It ought also to be slightly higher along the sides than in the center. The

front edge of the seat board should be rounding, and thus offer no sharp surface to irritate the limbs or check the circulation.

There can be little hesitation in saying that the typewriter's chair furnishes some fundamental ideas for the best school seat, and especially for the use of girls in the high school. The only criticism on the backs of these chairs is that they are generally open below the sliding block, and hence sometimes cause uneasiness with reference to proper adjustment of belt and placket. In that form of desks most frequently found in schoolrooms, the seat is fastened to the desk immediately in the rear, and is as long as the desk top. There seems to be no valid reason for this, even from the point of view of construction. It is certainly better not to have the seat any longer from left to right than a comfortable sitting posture of the body demands, for this would prevent much careless lounging about, and also make it much easier for the pupil to pass in and out. Besides, it would give a little better standing room by the side of the desk.

When benches are used, and the seat is the same length as the desk top, in order to lessen the difficulty of getting in and out it has been found necessary to hinge the seats so they can be raised when the pupils wish to get out. This has always been one of the noisy, troublesome features connected with such desks, though it does afford a janitor more room when cleaning the floors. When seats are made the proper length from side to side, and when they are properly placed with reference to the desks, the necessity of hinging them has largely disappeared. Seats made in chair form represented by the accompanying cut are among the best on the market for school purposes, and are used in many parts of our country, and there are no serious objections to them on account of the inconvenience of getting out and in. At one time seats like these swiveled to the upright were manufactured, but they were soon found to be impracticable, for the children were not only unsteady while at work, but they found much fun in turning about, and became expert in making the seat squeal. A curious form of seat board was described by Horace Mann in the supplement to his first *Annual Report*. It was designed primarily, as the accompanying cut will show, to furnish standing room, rather than to make it easy for the pupil to get into his seat or out of it.



No satisfactory seats appear to have been made which depend on adjustments to provide each child with a seat of the proper width. Fortunately the dangers incident to maladjustment here are not so great as those where the seat board is too high or too low. Still there are some important considerations touching this matter which teachers, and school authorities in general, should not neglect. If the seat board is too wide from front to back, it will cause the pupil to slide away from the back rest and bend over the desk. If it is too narrow, it will not furnish sufficient support for the thighs, thereby impeding circulation and also rendering the sitting posture unsteady and awkward. The seat board ought to be sufficiently wide to reach within at least two inches of the under side of the lower limbs, when flexed at the knee, when the pupil sits well back in the seat and properly uses the back rest. In the main, the various sizes of seats, furnished to suit the grades by the manufacturers, are not seriously at fault in this respect. But this should not relieve the teacher from making every effort to secure the best adjustments possible.

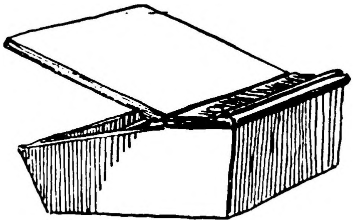
5. Desk tops ought to be made of well-seasoned hard wood, and finished with a dull surface to prevent troublesome light. At present, most desk tops are too light in color, and reflect into the eyes useless light. The children would get a good deal of relief from eyestrain, if the desk tops were of a dark dull brown rather than the natural oak or maple finish generally found. It stands to reason that all of the needless reflected light that can be kept out of the pupil's eyes will serve to make that from his book or paper more effective.

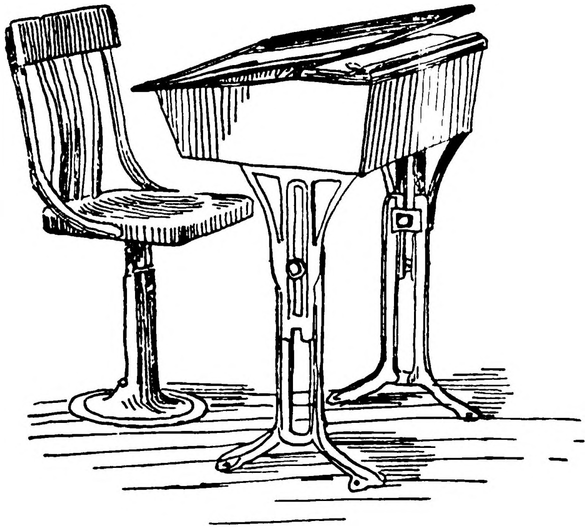
While some objection might be raised to darker desks on the basis of light absorption and the more somber tone thus introduced into the schoolroom, all observant teachers will remember that the best and most satisfying furniture in the homes, historically considered, are those pieces made of the dark woods, or those stained to give the dead weathered effect. Besides, the walls above the line of vision with their lighter shades, and the pictures, maps, etc., will furnish sufficient brightness of tone to counteract any somber effect produced by a darker colored desk. The danger due to the absorption of light would necessitate light-colored desks in all rooms not sufficiently lighted.

6. One of the necessary conveniences of a school desk which gives the teacher much trouble is that of inkwells. Perhaps the time is coming when fountain pens will be made sufficiently cheap, durable, and reliable to warrant school authorities in furnishing them free to the children of the upper grades. But that time is not here, and at present there must be used inkwells set somewhere in the desk top.

The best place for these is on the level ledge near the right-hand corner. They must be easily removable by the janitor when they need cleaning; they must be covered when not in use, to prevent evaporation and the gathering of dust in the ink, and they must be so situated that they can be easily filled without spilling the ink on the desk. When placed as far to the right corner as possible, they offer less temptation for the listless child to handle or disturb them thoughtlessly. Then, too, this position removes them from contact with the ordinary book or writing tablet. They should be set flush with the surface of the desk top and fitted with a noiseless, close-fitting lid.

7. Each desk should be so constructed as to furnish a safe, convenient, and inclosed place to hold all necessary books, pencils, and paper when not in use. The usual way is to insert a shelf some inches below the desk top. This plan is not satisfactory, as every teacher who strives for efficiency and neatness knows. From such shelves, books are always falling because the child can neither see how to arrange them when putting them away, nor can he easily get the book he wants after it has been put away. When so placed, books and papers gather much dust, and are rarely arranged neatly, even though the teacher wastes much time in inspection. Such shelves, if wide enough to accommodate geographies and other books of like size, are often troublesome to the knees of the pupils in the higher grades. A much better arrangement, in every way, consists in making a tight box under the lid of the desk, as shown in the accompanying cut. This keeps all books, papers and implements out of sight when not in use, shields them from much dust, and prevents them from falling on the floor. It also often prevents books from being lost, or taken by those to whom they do not belong.



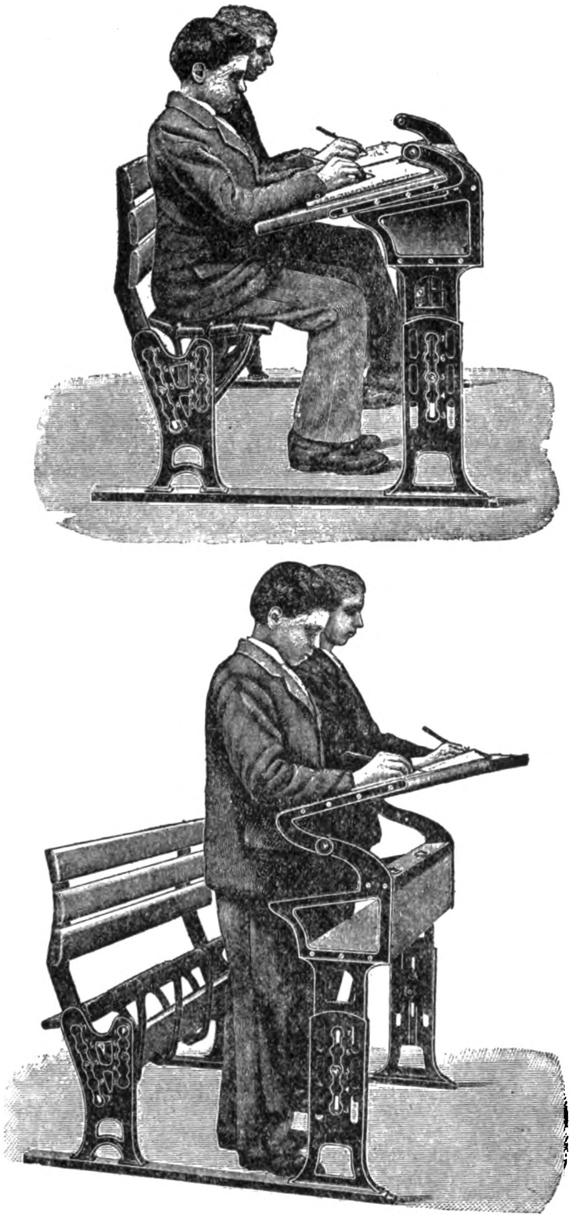


8. Aside from the proper height of seat and desk, and proper amount of light, heat, and fresh air, nothing in the way of school hygiene is more important than the proper adjustment of the desk top to the work the pupil is called upon to do.

The general truth which should be emphasized is that the line of best and easiest vision to the page of a book or writing tablet will fall approximately at a right angle, and either the child will adjust *himself* or else he will adjust his *books* to meet it, but cannot adjust his writing to meet it. Any teacher who has given unbiased thought to this matter, and who has sought to habituate her pupils to sit erect while writing or reading at flat-top desks, or those with a slant even as much as 10° or 15°, will agree that it is practically impossible to keep children from bending over their work. Day after day and month after month, attempts are made to habituate certain classes of children in the primary grades to work while sitting erect. They are eager to obey, as nearly all children of the primary classes are, but they cannot keep straight. They do not bend over out of a spirit of carelessness or laziness, but because of a demand for clear, distinct, and unmolested vision. And when one finds school children *en masse* persistent in any line of behavior, it is always a wise precaution to withhold judgment against such behavior until time has been taken to investigate the real causes underlying such action. As a result of certain attempts to habituate children to a proper posture while seated at the ordinary desk with a top sloping about 10°, it was found that in nearly all cases the pupils held their books in their hands, and that the angle of easy vision apparently demanded a slope of 45°. A comparable experiment could not be made for actual writing because there were no desks with that slant to use, and holding paper or even cardboard for writing introduced too many difficulties. However, when asked to hold their writing book in such a way as to read most easily, the same results, of course, were obtained as in the case when holding printed books. Now, when considering these results with reference to the problems of crooked backs, narrow chests, myopia, and many other ills due to improper posture, it became evident that the children are being seated in desks which make it absolutely necessary for them to lean over to read and write, or else to hold their books in their hands. It is very plain that they will not hold their books properly for any length of time, for the simple reason that it is impossible for them to do it. Children are restless partly because they fatigue quickly in any one position, and to expect them to hold up their books, in order that they may sit in an erect position, is altogether beyond reason. But when they rest their books on the desk, to get the right angle of vision and sufficiently near the page to read easily, they must of necessity bend over their work. On this basis and no other can one account for the persistent tendency of school children to take bad postures, for otherwise they will take a normal position for the greater part of the time. And just at this point it must be insisted upon that children must be allowed to rest themselves even from sitting erect. Anybody knows that it is very restful to bend over occasionally, even though sitting in the most comfortable chair and listening to an interesting speaker. But school desks as at present made are undoubtedly demanding abnormal postures and making them habitual. The objection that the ink will not flow well when writing on a desk at a slant of 45° is of course rather serious, but only when considered with reference to the time spent in writing with ink. But this forms a very small part of the written work of the children, and the pencil can be used as readily on a desk of this slope as on a flat one. Besides, the time is almost here when fountain pens will be used in the upper grades instead of the ordinary steel pens, and then the difficulty will be practically overcome, for these often need a little holding back to prevent flooding. "The least possible work will be given the eyes if the reading matter rests on a desk at an angle of 45° with the horizon, because in this position the bottom of the page will be at the same distance from the eye as the upper part, and the eye will be able to read all the type thereon without changing its focus to any appreciable extent. For writing, however, a desk top at an angle of 45° would have serious disadvantages. For instance, the ink would not flow properly from the pen at this angle, and, moreover, the arms and hands would have to be held in an irksome and tiring position. The most convenient slant for the writing desk is an angle of 15° with the horizontal." (Lyster, R. A. *School Hygiene*, pp. 123–124. London, 1908.) With reference to Dr. Lyster's statement that writing at a desk with a slant of 45° necessitates that the "arms and hands would have to be held in an irksome and tiring position," it will be illuminating to recall

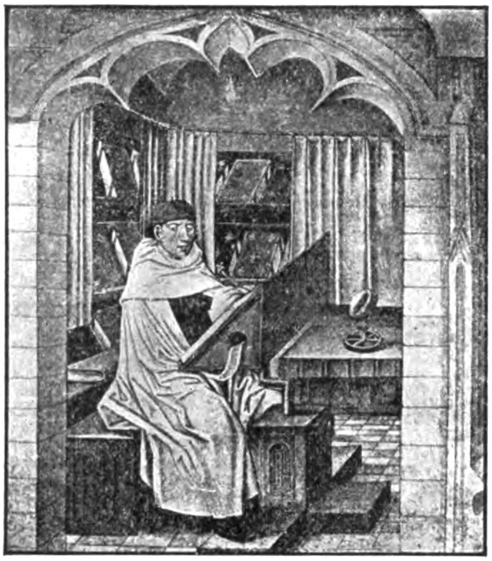
An Adjustable Steel Frame Desk and Seat.

Adjustable Desk and Seat made of Compressed Steel.



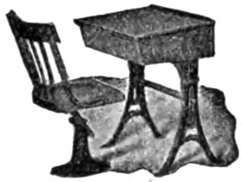
A Favorite German Desk.

that during the Middle Ages, when the best writing the world has ever seen was done, and when all books were made in manuscripts, the monks and copyists almost invariably worked at desks with a slant approximating 45°. Of course, in the beginning of such work, they may have been inclined to take delight in "crucifying the flesh," and readily worked under many inconveniences, no doubt; but as time went on they not only sought to relieve themselves from useless pain, but also came to look with much favor and approval on whatever made their work easier and gave them better means of doing it more beautifully. It is not probable that the slant of the writing boards and desk tops used then grew out of any desire to take an awkward position. The pictures they left of their desks indicate very plainly that at this time they sought a slope which would enable them to do their work with the greatest comfort and skill. No one can study with any degree of carefulness the wonderfully illuminated books and manuscripts preserved from the half century prior to the invention of printing, without realizing that those who made them wrought for the glory of God, and the delectation of humanity through truth and beauty, rather than through the desire to set tasks for themselves or devise means of torture and pain. After a good deal of time spent in going over such manuscripts and illuminations, no evidence can be found that writing on desks at the slant they came to use was awkward or irksome. If the reader wishes to assure himself on this point, he will find a number of illustrations in John Willis Clark's book, *The Care of Books*, bearing on this point. Note the slant of the board upon which the writing is done, the distance of the eyes from the work, the direction of the line of sight, the weights designed to hold the parchment not in use, position of the inkhorns showing the use of the right hand, the near position of the bottom of the board, the string at the left for holding the board and adjusting its slant, and the width of the board. A scribe so conditioned could not do his work without sitting fairly erect; and this, to my mind, is the only solution to the problem of securing correct postures in school children; we must so condition them for their work that they cannot do it without maintaining good posture. Doubtless objections will be urged against taking this Middle Age document as a guide, for it will be said, and said truly, that the writing of that time was more in the nature of printing by hand or painting with a pen, as an artist draws and paints with a brush, than a cursive handwriting. The fact remains, nevertheless, that these copyists and illuminators worked out a slant for a writing desk to suit the demands of their work and the hygienic posture of their bodies. There is but little doubt that, if adults were compelled to go to school to-day, and required to work as children work, it would be but a short time until school desks would show great improvement. As long as children sit at them it is, for most people, easier to let them alone and go on in the "good old way." The discussion of the desks used by the monks of olden times, and the illustration accompanying it, have been introduced for the purpose of suggestion and comparison, rather than as direction and guidance; but when the ideal hygienic desk top is made, it will be at an angle not appreciably smaller than that represented.

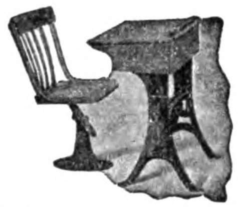


A Monk in the Scriptorium.

Put briefly, the essential requirements of convenient and properly constructed desks are as follows: (1) They should be single, that is, made to accommodate one pupil. (2) The seats and desks should be separate, so that the movements of one pupil would in no way disturb another, and also that each pupil may have both seat and desk adjusted to his individual needs. (3) Both desks and seats should be so constructed as to be readily adjusted to the specific individual needs of the pupil. (4) The desk should be provided with a box to receive all books and supplies, and keep them free from dust. The open shelf under the desk top is not satisfactory. (5) The box for books and supplies should in no way interfere with the movements or easy posture of the pupil while seated. (6) Both desk and seat should be strongly constructed, so that when fastened to the floor, they will be firm and steady. (7) The supports and braces of the desk should be so arranged as to give free and easy movements of the pupils' feet without bumping. (8) Those desks so constructed as to offer the least interference to cleaning or polishing the floor are, other things being equal, to be preferred. (9) The desk top ought to have a much greater slant than now given, in accordance with the reasons given in the preceding discussion. (10) Both desks and seats should be adjustable in all parts as to height, position, shape, and slant. (11) The desk should be so situated with respect to the seat that the lid of the desk should overhang the seat two inches at least. (12) Each child in the grades should be measured sitting and standing at least twice or three times during the school year, in order to make adjustments as frequently as needed. (13) Desk tops should be without high polish and of a color which will not reflect too much light into the eyes of the pupils. A color which will give an easy contrast with the pages of a book will meet this requirement. (14) Seats and desks should be strong, simple of construction, and easily cleaned, and so finished that the use of disinfecting materials will not harm or blemish them. (15) Seat boards should be wide enough to comfortably accommodate the pupil, but no wider. (16) On the whole, where single desks are used, there is less noise and trouble with seats in the form of chairs than in the form of benches. It is better, too, where single desks are used to have children stand in aisles to recite than to turn back a hinged seat and stand behind his desk. With a properly constructed chair and desk, plenty of room is given for him to get in or out without trouble or disturbance. (17) The chair back should be adjustable to the changes in the curve of the back, especially of adolescent girls, as noted in the discussion above. (18) The back of the seat should reach nearly to the shoulder blades when the pupil is sitting properly, and should never be higher. Most school seats err in this regard. (19) There are some distinct advantages in the style of German desks illustrated which permit pupils to stand while working, so as to get a restful change of position. (20) Desks made with the slant suggested must have a slight ledge near the inner edge to keep books from sliding off. A groove near the outer edge is needed to retain pencils and pens. (21) A chair or bench with a solid back is better than one with spindles, or open boards. F. B. D.



Adjustable Chair Desk with Lifting Lid.



Adjustable Chair Desk with Open Box.

For References, see article on ARCHITECTURE, SCHOOL.

DES MOINES COLLEGE, DES MOINES, IA. — A coeducational institution founded in 1865, and under Baptist control. Preparatory, collegiate, educational, musical, and commercial departments are maintained. Fifteen units of high school work are required for entrance. Admission is by examination or on certificate from an accredited school. The course in the department of education leads to the first-grade state certificate. There are nine professors and twelve instructors on the faculty.

DESTRUCTIVE CRITICISM. — See SUPERVISION OF TEACHING; CRITICISM, THE FUNCTION OF EDUCATIONAL.

DETENTION. — One of the means of punishing children at school is to deprive them of privileges. Detention from play and other dispositions of child leisure is one form of punitive deprival. Detentions are usually of two sorts: (1) detentions from play at recesses or other intermissions, and (2) detentions after school. Owing to the increased appreciation of exercise, fresh air, and recreation as factors in the health of children, detentions are less used than before. Detentions for failure in school work are more and more infrequent as teachers realize that such shortcomings are not primarily matters of moral laxness to be overcome through punishment. The imposition of work from the school studies as a means of keeping the child busy during detention is likewise decreasingly justified by teachers, inasmuch as it tends to create a hostility on the part of the child toward the subject thus used.

See REWARDS AND PUNISHMENTS; SCHOOL MANAGEMENT.

DETENTION SCHOOLS. — A term sometimes applied to schools for delinquents (*q.v.*), but more properly to classes formed for children who are awaiting trial or being held as witnesses. In the New York City jail (" The Tombs ") such classes have been maintained for years by philanthropic individuals. The children confined there have usually had poor educational advantages, and since the opportunities to do effective teaching in the jail are good, some of the teaching has produced unusual results. With the development of suitable machinery of oversight and probation in connection with the Juvenile Court (*q.v.*), the older fashioned detention school will doubtless disappear.

DETERMINANT. — A device for representing certain types of algebraic expressions in a contracted form. Thus the determinant

$$\begin{vmatrix} a & b & c \\ a' & b' & c' \\ a'' & b'' & c'' \end{vmatrix}$$

stands for the expression $ab'c'' + a'b''c + a''b\,c' - a''b'c - a'b\,c'' - a\,b''c'$, and is a much shorter way of representing it. A determinant with two terms on a side is a determinant of the second order. The one above given is of the third order. Determinants may be of any order n, where n is a positive integer. There are simple methods for expanding determinants, as may be seen in higher algebras or in treatises upon this special subject. Determinants are used to advantage in solving sets of linear equations involving a considerable number of unknowns. They are also often helpful in analytic geometry and in higher analysis. At present there is a little tendency to use the notation in elementary algebra, but it gives slight promise of success, owing to the abstract nature of determinants. The theory began with Leibnitz (1693). Vandermonde (1771) first treated determinants as an independent theory. Lagrange (1773) and Gauss (1801) did a great deal for the perfecting of the theory. Jacobi (1827) was one of the greatest writers upon the subject, and to him is due the final acceptance of the term "determinant." The general idea is also found in the writings of the Japanese scholar, Siki (seventeenth century), and a primitive treatment is seen in the writings of the Chinese in the twelfth century. D. E. S.

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DETERMINISM. — The general doctrine which teaches that the human will is controlled beyond the possibilities of arbitrary individual choice. Determinism is opposed to libertarianism. According to libertarianism the individual is free to decide at any moment without further motive than his choice between alternative ends. According to the doctrine of determinism, the individual is determined in his choice by his past experiences and the present situation. There are two possible interpretations of this doctrine. The first would teach that the individual is controlled in his choice by external influences, especially by his present sensory impressions. This type of the doctrine is not widely held at the present time. That the individual is determined by his inherited organizations and by the habits which have been developed in the course of his individual life is very generally held. Sometimes the doctrine is modified so as to recognize the possibilities of new forms of combination at certain special periods of life. These special combinations are sometimes called variations in behavior. The whole discussion has historical importance because of its bearing on the general doctrine of the freedom of the will (*q.v.*) and the relation of this doctrine to education. It has been held that unless the child is free to follow his own choice it is futile to try to influence him through any appeals to his intelligence. On the other hand, it is pointed out that if education is to be finally effective it must depend upon the assumption that the individual can be determined in his future conduct by his present training.

Whatever the difficulties of the doctrine of freedom, there are certain undeniable facts which relieve the educator of embarrassment in connection with the philosophic controversy of determinism *vs.* indeterminism. These are plasticity, or the modifiability of disposition and character; the function of reflection and deliberation in emancipating the agent from servility to blind impulse and chance circumstances; and the persistent tendency of well formed habits. J. D.

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DETERRENTS, SCHOOL. — Those regulations, customs, and other influences of school life which act as restraints upon undesirable conduct, more especially those inhibiting controls of school discipline which are peculiar to its organization, such as low marks, failure of promotion, etc. Deterrents are usually more or less coercive, operating through fear.

See DISCIPLINE, SCHOOL; GRADING AND PROMOTION; INCENTIVES; INTEREST; SCHOOL MANAGEMENT.

DETROIT COLLEGE, DETROIT, MICH. — See JESUS, SOCIETY OF, EDUCATIONAL WORK OF.

DEUTSCHE LANDERZIEHUNGSHEIME. — A type of private boarding schools developed very recently in Germany, growing out of, or strongly influenced by, the experiments at Abbotsholme (*q.v.*) and the practice school at Jena. They have been built up by Dr. Hermann Lietz. Many intelligent parents have welcomed a movement in which a more realistic program is followed and more attention is paid to physical development and to the fundamental activities of social relationships and of industry. In the *D.L.E.H.* boys of several social grades meet on a plane of social equality, and thus an opportunity is given for natural excellence to receive more adequate recognition. The general atmosphere of the school is one of a rare *Gemütlichkeit*. These schools are of importance in forwarding the movement toward more democratic education. (See BOARDING SCHOOLS.) Professor Münch, in *Zukunftspädagogik*, and Professor Paulsen, in *German Education*, refer to the schools, and consider their extension probable and desirable.

The *Schulreise* has not been neglected; the neighboring states are visited, and longer trips are made to Italy and Greece. These schools are more completely to themselves than are those in the other countries. There is an almost entire absence of woman's influence, and the culture epoch idea that a boy's most significant education comes from companions of his own years results in three widely separated schools, thus carrying education by contemporaries to a logical conclusion. Religious education retains a prominent place in these schools, and is worked out on a very intelligent and suggestive basis.

F. A. M.

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D. L. E. H. Zeitschrift (Berlin), and *Annual Reports.*
FREI, WILHELM. *Landerziehungsheime: Darstellung und Kritik einer Modernen Reformschule.* (Leipzig, 1902.)

DEUTSCHE WALLACE KOLLEGIUM UND NAST THEOLOGISCHES SEMINAR, BEREA, OHIO. — A coeducational institution, founded in 1864, maintaining preparatory, collegiate, musical, commercial, and theological departments. The college courses, classical, scientific, philosophical, and literary, which are based on about twelve points of high school work, lead to their appropriate degrees. Much of the instruction is given in German. Students who hold college degrees are admitted to the theological course, which leads to the degree of Bachelor of Divinity. The teaching staff numbers over twenty.

DEVELOPMENT. — During the latter part of the eighteenth century, "development" became the watchword of educational reformers. The primary assumption of the liberal school of thought all over the continent of Europe was the essential harmony of nature and the needs and satisfaction — the happiness — of man. The reaction against supernaturalism that came in with the Renaissance resulted in the Enlightenment in a virtual substitution of nature for revelation. By its own intrinsic workings either Nature (*q.v.*) as a uniform law-abiding instrument of a benevolent Deity, or else as itself a sort of beneficent God was the final principle of order and simplicity or system, and, hence, of well-being.

In the seventeenth century, Newton had reduced physical nature to a comprehensive rational order effected by the balancing of two ultimate forces, and Locke had accomplished a parallel task for human nature. Leibnitz had introduced the notion of an absolutely detailed and complete (because pre-established) harmony of spirit and matter, man and nature, reason and morals. France, especially under the leadership of Voltaire, made a popular combination of these various notions. "Nature" became the norm of all that was orderly and rational, the weapon of criticism of all that was artificial, arbitrary, and capricious. Since human nature was included in the scope of nature, it, too, had its own operations and laws, wholly independent of civil institutions, traditions, and customs. Hence there were two types of education possible, one artificial, which perverted nature by making persons conform to arbitrary external conditions; the other natural, consisting in the unfolding or development of the intrinsic forces of the human being. While France elaborated especially the negative and critical side of this doctrine, German thought worked out a theory of the various natural faculties or powers of the soul, and the supposed laws of the order and manner of their unfolding. Indirectly, at least, this movement was due to the influence of Leibnitz, who had taught that all ultimate or true substances — including the soul — are self-contained centers of energy; had denied that they can exercise any influence on one another; and had, therefore, accounted for all the phenomena of change as simply making explicit what was already implicit in the substance itself. This process of external manifestation of intrinsic capacity he termed *evolution*, it being an axiom that nothing could be *e*volved except what was already *in*volved. Applied in education, this conception was, of course, totally hostile to all theories that conceived education as a bringing to bear of external forces upon the mind. True education was simply to supply such conditions as would enable the soul to unfold in its own orderly sequence its own inherent powers. This conception was finally summed up in the definition of education that became a classic in the early nineteenth century: Education is the complete and harmonious development of all the human faculties, moral, intellectual, physical, and æsthetic.

The development of psychological and social science in the nineteenth century showed that there is no such thoroughgoing harmony of nature and humanity as was implied in this conception of education. The tendency of the industrial development was not to institute final peace and good will among men, but to emphasize class antagonisms and to create new causes of discord between nations. Nevertheless, the whole tendency of biological science was to retain the notion of development as one of fundamental importance in education as a notion which, negatively, contrasted with cramming and passive absorption, and, positively, put the idea of normal growth in the foreground. The contemporary notion of development differs from the older notion in two respects. First, it insists that development must be measured from the standpoints of specific ends to be attained. There is no development at large or unfolding in general going on. There are many ends undergoing realization through gradual growth of the means adapted to them. Since the ends of action are social, this interpretation does away with the isolation of individual powers implied in the older definition. Secondly, the positive necessity of a favorable environment to secure development is recognized. It is not enough to eliminate arbitrary and perverting conditions; growth cannot go on in a vacuum. As the body requires air and food, so mind and character require a culture medium in order to develop. Development, in short, has become a notion which, on one side, emphasizes the native and spontaneous existence, in the one educated, of the fundamental and initial factors of education, while, on the other, it emphasizes the social nature of growth as an aim and the necessity of social conditions in order that growth may be in the right direction.

J. D.

DEVELOPMENTAL LESSON. — See TEACHING, TYPES OF.

DEVELOPMENTAL METHODS. — The method of development in teaching is a mode of teaching through which the pupil acquires most of the desired facts through his own activity rather than through the statement of teacher or author. These facts may be of varied sorts, including concepts, judgments, generalizations, inferences, definitions, laws, rules, and principles. Developmental teaching is usually contrasted with the method of instruction. In the one case, the teacher leads the child into knowledge; in the other, the instructor tells or states the fact more or less authoritatively. From the standpoint of the learner, the developmental method gives a direct experience, while the method of instruction starts from another's exposition of an experience, the child getting it indirectly, second-hand, as it were. From the standpoint of the teacher's activity, the developmental method is an indirect method of conveying the fact from the teacher's mind to the child's mind, while in instruction, the teacher tells the fact direct to the child, without the interposition of concrete experiences, judgments, and reflections as a basis for the child's own conclusions. In the method of development, the child believes the facts taught primarily because of the evidences within his own possession; in the method of instruction his belief is primarily an acceptance of authority.

The advantages of developmental modes of teaching over those of instruction are: (1) It stimulates the child's initiative and develops self-reliance. (2) It tends to interrelate concrete and abstract knowledge in the most useful ways. (3) It makes the recall of the facts thus learned easier and more certain. (4) It is a transition method between instruction and independent thinking. Its disadvantages are: (1) It is a longer process for teaching a fact than instruction. (2) It is not at all applicable in fields where the concrete fact cannot be revived, as in geography and history. (3) It frequently tends to the exclusion of the legitimate coöperation of the teacher in telling facts and correcting defective generalizations and inferences. The method of development and the method of instruction are not competitive means of teaching. They are supplementary, each being valuable where the other is least efficient. It will seldom occur that one method is used to the exclusion of the other. In fact, the two methods should be in constant supplementary employment, the practicality of the distinction residing largely in the relative preponderance of one mode of instruction in any given lesson, rather than in its exclusive use. Facts of concrete experience that cannot be reproduced effectively, or at all, under the artificial conditions of classroom life, such as many scientific, geographical, and historical facts, are usually taught by instruction through language, books, and graphic representation. Formal or conventional facts, such as occur in teaching linguistic usages or social manners, are also usually conveyed through the method of instruction. But facts that are of the nature of generalization and inference are usually best presented through the method of development. The concepts of arithmetic, the generalizations of science, the rules of grammar, etc., are of this latter type.

Developmental methods are usually of two types: inductive and deductive. The inductive method of development is utilized in developing general facts from a series of individual facts, as in presenting the number concept from several objective experiences in arithmetic, or in formulating the law of agreement between subject and predicate in grammar, etc. The deductive method of development is utilized in identifying one or more general principles with a concrete case, as in all inferences and applications from general principles in geography, science, civics, etc. H. S.

See ANALYSIS AND SYNTHESIS; DEVELOPMENT; DIRECT METHODS OF TEACHING; INDUCTION; INDUCTIVE AND DEDUCTIVE LESSONS; INSTRUCTION; TEACHING, TYPES OF; RECITATION, METHODS OF.

DEVENTER. — A town in Holland, sixty-six miles east of Amsterdam. In the fifteenth century, Deventer was the center of the humanistic movement for Holland and the parts of Germany bordering on it. The Latin School of St. Lebuin, the patron saint of the town, had a European reputation, which was acquired under the headmastership of Alexander Hegius (*q.v.*) from 1483 to 1498. From this school there went out, among others, Erasmus (*q.v.*), Murmellius, and Hermann Buschius, famous among the northern humanists. The school and the town, which, according to a contemporary account by Butzbach (*q.v.*), was famous for the kindness and philanthropy of the citizens, attracted the wandering scholars of the day. A high standard of attainments was reached, and in the upper classes of the school classical work of university grade was done. The school had a long history. After the Reformation it came under the charge of the town. In the middle of the last century, the title of the school was changed to *Athenæum*. In addition to the school, the town was also famous for its printing presses, from which a number of classical texts were issued, and as the place of origin of the activity of the Brethren of the Common Life (*q.v.*).

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DEVICE, TEACHING. — In the broad sense, any special method of teaching. In a more restricted sense, a device is a highly specialized artifice of instruction, planned for a very particular purpose. It is usually a simple, concrete, and strategic method of teaching procedure. There are many types of devices, the most important of which are: (1) Formal plans of procedure, special systems or arrangements in teaching, of wide applicability, as the spiral method (*q.v.*) of arranging the course of study so that the maturing child will have repeated and enlarging treatments of the topics or facts previously studied. The Grube method in arithmetic, the synthetic method (*q.v.*) in teaching reading to beginners, the dictation method (*q.v.*) in spelling, are additional examples. (2) Special schemes or devices contrived to develop, drill, or apply the facts of instruction, as, the action work required in the first reading lessons of foreign children, or beginners; here the pupils act out the sentences they have read, the appropriateness of the action being the test of the correctness of the reading. Paper transactions in the teaching of commercial bookkeeping, and the topical method in history, also illustrate this type of device. (3) Particular contrivances, more or less material and mechanical, with a restricted use, such as the abacus (*q.v.*) in arithmetic. Diagraming in grammatical study and the use of graphs in the teaching of mensuration likewise belong to this category.

Teaching devices are usually characterized by their peculiar fitness to particular situations. They are ingenious in their simplicity, readily comprehensible, and easily managed by teachers; herein lies their strength. Their weakness is found in the fact that their use is easily abused by the unthinking teacher. They offer a ready-made concrete method of instruction, which is often carried over into situations where they are inadequate, if not misapplied. Many special systems of teaching which have enjoyed a temporary vogue have been attempts to give wide applicability to a few simple devices, the real applicability of which was limited. Despite the frequent criticism of the use of devices in teaching, it is recognized that they constitute a resource, in the form of concrete instruments and means of instruction, which is invaluable to the teacher. The disbeliever in devices may invent methods anew with each situation, gaining a flexibility and fitness for each situation, but he will be limited by his own personal resource. Devices, in a sense, represent the fixed institutional habits of the teaching profession; they are means of placing the experience of the teaching profession at the disposal of the individual instructor. The need is not for fewer devices, but for a more versatile series of devices, so as to allow of a large range of choice, and a more discriminating use of particular means. They represent concrete instruments for teaching, each of which has a specialized fitness for some situations, and likewise an unfitness for others. The special one-sided worth of a device always demands that it be used for the realization of a special purpose in a special situation, and not elsewhere. Its very special use should at once prompt its supplementation with other devices and methods. Only in this way can all the interests involved in the proper teaching of a given series of facts be properly conserved. The conventionalized nature of most devices makes them formal. They tend to be used somewhat mechanically, as if the results would come as a matter of course. As they need to be used selectively, they also need to be used flexibly. A little adaptation adds fitness and power to a device, and redeems teaching from mere mechanical routine. H. S.

See METHODS, TEACHING; SPECIAL METHOD; VISUAL AIDS TO TEACHING.

DEWEY, CHESTER (1784–1867). — Educator, who was for many years active in the improvement of elementary and secondary education in New York State; was graduated from Williams College in 1806. He was for eighteen years professor of mathematics in Williams College; for ten years principal of the Berkshire Gymnasium at Pittsfield; for fourteen years principal of the Rochester Collegiate Institute, and for seventeen years professor in Rochester University. Author of several essays on education and science.

W. S. M.

DEXTRALITY. — See AMBIDEXTERITY.

DIACRITIC METHOD. — Any special method of teaching beginners to read which employs special marks to distinguish the special sounds or values which letters possess in the pronunciation of words.

See PHONETICS; PHONETIC METHOD; READING, TEACHING BEGINNERS.

DIACRITICAL MARKS. — See PHONETICS.

DIAGRAMING. — See GRAMMAR, TEACHING OF.

DIAGRAMS. — See TEACHER'S AIDS.

DIALECTIC. — This term was, in its origin, practically synonymous with logic. Etymologically connected with "dialogue," its foundation rested upon the efforts of Socrates to introduce definition, generalization and systematic division of topics into discussion especially of moral and political matters, so that its outcome would lead participants into mutual agreement and self-consistency. Later dialectic was generalized by means of the science which had to do with the mutual implications and systematic arrangement of conceptions, definitions, and general principles. As one of the chief agencies of intellectual clarification, Socrates relied upon the development of vague and uncriticized notion into self-contradiction and self-refutation. By combining this aspect of dialectic with Kant's theory of the antinomies, Hegel developed the theory that dialectic is the movement of thought by which every inadequate notion develops into the contradiction of itself as a stage in the evolution of a more adequate conception that reconciles the one-sidedness of both the ideas out of which it develops. In the form of a law of mental development through the reconciliation of opposites, this principle has played considerable part in the modern philosophy of education, especially as an interpretation of Froebel's kindergarten gifts, and also as indicating the necessity of a stage of alienation, or disruption (*Entfremdung*) in the development of childhood into maturity.

J. D.

See ARISTOTLE; DEBATING IN THE SCHOOLS; DISPUTATION; LOGIC; SOCRATES; UNIVERSITIES.

DICKENS, CHARLES (1812–1870). — Dickens was a reformer as well as a novelist. One of his supreme aims was to free childhood from the tyranny, the injustice, and the wrong methods of training and teaching to which it was subjected. He introduced twenty-eight schools into his novels and sketches, some to expose the weakness of existing methods of training and of teaching, others to reveal new and better methods. He was the first great student and advocate of the kindergarten in England. He published in *Household Words*, in 1855, one of the most comprehensive and appreciative articles yet written on the kindergarten in English. His later works reveal an accurate knowledge of the vital principles of the Froebelian philosophy. His writings did much to arouse a genuine interest in and sympathy with childhood. He aimed to make the child and not knowledge the center of educational efforts and processes. He attacked fourteen types of coercion, and he tried to show that even the gentle but firm coercion of dear old Mrs. Crisparkle was as great an evil in the destruction of individuality, as the harsh and utterly inconsiderate coercion of Squeers or Creakle.

He advocated both in his editorials and in his novels the establishment of free national schools, and he was the chief agent in overthrowing bad private schools and academies in England, by exposing them in his descriptions of such typical schools as those of Squeers, Creakle, Mrs. Wackles, and Miss Monflathers. He was one of the first in England to plead for the establishment of normal schools for the training of teachers. He made special visits to two great educational leaders in America, — Henry Barnard (*q.v.*) and Samuel Howe (*q.v.*). From the first he learned the value of free national schools, and by the second he was inspired with the enthusiasm he afterwards showed in favor of educating the deaf, the blind, and the defective. His most pathetic story, *Dr. Marigold*, aroused deep interest in the training of the deaf; and Caleb Plummer's daughter, in the *Cricket on the Hearth*, awakened sympathy for blind children in all civilized countries. *Barnaby Rudge* led humanity to take an interest in feeble-minded children, and Poor Jo aroused the British people, and led to the opening of schools for the neglected children in cities and towns.

Dickens advocated the teaching of music, art, and manual training in elementary schools. He made an exposure of every possible kind of "cramming" in *Dombey and Son*, *Hard Times*, and *Mrs. Lirriper's Lodgings*. He discussed the special evil of working a child beyond the "fatigue point" in his article on the schools of the Stepney Union.

He pleaded for a free, real childhood in nearly every book he wrote, especially in *Hard Times*, *Dombey and Son*, *The Tale of Two Cities*, *Bleak House*, *Martin Chuzzlewit*, and *Mugby Junction*. The need of the fullest development of the imagination is clearly revealed and intelligently discussed in *Hard Times*. In the preface to the first number of *Household Words*, Dickens stated that one of the reasons for publishing the magazine was to aid in developing the imagination of the children. The importance of developing the individuality of each child was made prominent in *Hard Times*, *Our Mutual Friend*, *Dombey and Son*, *David Copperfield*, *Bleak House*, and *Martin Chuzzlewit*. Physical training and the great importance of proper nutrition were urged in *Dombey and Son*, *David Copperfield*, *Nicholas Nickleby*, *Oliver Twist*, *Great Expectations*, and *Edwin Drood*.

Dickens understood clearly the ideals of the new education, and by revealing them incidentally in his novels, he influenced a much larger audience than he could have reached if he had written treatises on education.

J. L. H.

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HUGHES, J. L. *Dickens as an Educator.* (New York, 1901.)

DICKINSON COLLEGE, CARLISLE, PA. — A coeducational institution, and the second college in the state, chartered by the legislature of Pennsylvania, Sept. 9, 1783. Established on what was then practically the frontier, Dickinson was the first college founded to meet the needs of the population in the new West. The name was chosen in recognition of the services to the United States, and the " very liberal donation " to the college of John Dickinson, Governor of Pennsylvania, the author of the famous *Letters from a Pennsylvania Farmer*. In its early years the college was occasionally aided by the state. Placed in a Presbyterian community, most of its earlier presidents and trustees were members of that denomination. The original charter provided that the successors of the thirteen clerical trustees should also be clergymen, but this direction was repealed by an act of 1826, whereby it is provided that " not more than one third " of the trustees shall at any time be clergymen. Since 1890, the Board of Trustees consists of fifty members, four elected by the alumni. In February, 1907, the Board of Trustees passed resolutions declaring that " Dickinson College is under the friendly auspices of the Methodist Episcopal Church, but has never been owned or controlled by any church body." In the same year, the college was accepted by the Carnegie Foundation for the Advancement of Teaching (*q.v.*) as a nonsectarian institution participating in its system of retiring allowances to professors. In 1890 a school of law was erected as a part of the corporation, and the degree of Bachelor of Laws, which from 1834 to 1882 had been conferred upon the graduates of a private law school existing under the general patronage and supervision of the college, was formally recreated. This school is controlled by a self-perpetuating Board of Incorporators of fifty-five members. In addition to the degree of Bachelor of Laws, the college confers in course the degrees of Bachelor of Arts, Bachelor of Philosophy, Bachelor of Science, and Master of Arts.

The record of Dickinson's alumni is remarkable. With Princeton and Bowdoin, Dickinson is the only other American college possessing the distinction of having graduated in arts both a President of the United States and a Chief Justice of the Supreme Court. The list of other Federal judges, of members of state judiciaries, and of governors of states is surprisingly long, while it is doubtful if any educational institution of a similar size has furnished to its country as many as nine cabinet officers, ten members of the highest legislative body, and fifty members of the Lower House. In addition, the legislature of Pennsylvania began very early to contain a large number of Dickinson graduates.

Grounds, buildings, and equipment are valued (1909) at $501,000. The total productive endowment is $378,808; the annual income is $22,240. Tuitions and fees from students amount to $69,465. The total annual income is $62,076. There is an outstanding debt of $153,667. The average salary of a professor is $1700. There are nineteen members on the instructing staff in the college, of whom fifteen are full professors; in the law school the instructing staff numbers seven full professors. The enrollment in 1910–11 was 428, of whom 351 were in the college and 77 in law. C. G.

DICKINSON, JOHN WOODBRIDGE (1825–1901). — Schoolman; educated at Williston Seminary and Williams College, graduating at the latter institution in 1852. For the next twenty-five years he was connected with the State Normal School at Westfield, Mass., and from 1877 to 1894 he was secretary of the State Board of Education in Massachusetts. He wrote a history of education in Massachusetts, and numerous papers on the art of teaching.
W. S. M.

DICKINSON, JONATHAN (1688–1747). — The virtual founder of Princeton University, and its first president; was graduated at Yale in 1706. Author of *Familiar Letters to a Young Gentleman* (1745), and of numerous theological essays. W. S. M.

Reference: —

HAGEMAN, J. F. *History of Princeton and its Institutions.* (Philadelphia, 1879).

DICTAMEN. — The term applied in the universities of the Middle Ages to composition in prose and verse indifferently. It included not only the study of the rules of prosody, but of all kinds of prose composition, letter-writing, legal documents, and official correspondence. It thus formed an important part of the general education of the law student at Bologna, and several important works on the art of dictamen appeared at this university, for example, Irnerius (*q.v.*) wrote a notarial form book (*formularium tabellionum*). Bernard Silvester of Tours (*q.v.*) composed a work in verse on the writing of Latin letters. Generally the art of dictamen formed part of the study of rhetoric, but at Orleans it became " almost a distinct faculty," and the master of the school came to be known as *magister in dictamine*.

See LIBERAL ARTS, SEVEN; RHETORIC.

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ABELSON, P. *The Seven Liberal Arts.* (New York, 1906.)
RASHDALL, H. *Universities of Europe.* (Oxford, 1895.)

DICTATION, METHOD OF. — A special form of classroom exercise, in which the teacher tells or reads a series of sentences which the children are to write down. It is a method for testing or drilling the child's command of details as used in context. In penmanship, after the child has mastered parts of letters, letters, and words, the work is supplemented by rapid writing from dictation so as to make the practice in penmanship more nearly normal. A more frequent use of this method is found in the teaching of spelling. Here the old word list method is supplemented by sentence or paragraph dictation, where the attention is likely to be divided between meaning and form in a natural manner. Dictation is sometimes used in the teaching of composition, though its value here is much more restricted. The method of dictation is a special form of the contextual method. H. S.

See CONTEXTUAL METHOD; SPELLING, TEACHING OF.

DICTIONARY. — A collection of words, commonly a general vocabulary, arranged in some kind of alphabetic order with a statement under each word of information as to its spelling, pronunciation, meaning, or etymology. Most of our larger dictionaries give information on all these subjects, and most of our smaller ones on spelling, pronunciation, and meaning. The term "dictionary," however, is used of various other classes of alphabetic vocabularies, and more loosely of works having subjects treated under brief titles arranged in alphabetical order, as in Bible dictionary, architectural dictionary, etc. (For the principal works of this kind, see ARCHITECTURE, ECONOMICS, ENCYCLOPEDIAS, etc.)

The modern general English dictionary has its immediate origin in the word lists or vocabularies of the fourteenth, fifteenth, and sixteenth centuries. The earlier lists, of which the *Catholicon Anglicum* is the most notable, were mainly lists of words in foreign languages with their English equivalents. The first list of English words with English definitions was *A Table Alphabetical of Hard Words*, published in 1604 by one Robert Cawdrey. The first to assume the title of *English Dictionary* was that commonly called Cockeram's dictionary, published in 1623. The chief dictionaries to appear between this and the publication of Johnson's dictionary in 1755 were: in 1656, Blount's famous *Glossographia;* in 1658 Phillips's dictionary entitled *The New World of Words*, largely based upon Blount; in 1677 *Schoolmaster Cole's English Dictionary explaining the different terms that are used in divinity, husbandry, physic, philosophy, law, navigation, mathematics, and other arts and sciences:* in 1717 Bailey's *Universal Etymological English Dictionary*, which was chiefly devoted to technical terms of the arts, trades, and sciences, and was the first to give reasonably full etymologies. Bailey also was the first to introduce the stress accent for indicating the pronunciation of words. Benjamin Martin, in his dictionary published in 1749, indicated the number of syllables, and by the use or omission of accents indicated the quantity of many long and short syllables.

Johnson's dictionary, with which modern English lexicography may be said to begin, appeared in 1755 in two large folio volumes entitled *A Dictionary of the English Language in which all words are deduced from their originals, and are illustrated in their different classifications by examples from the best writers.* The chief distinctively new features introduced by Johnson were the use of illustrative quotations and a more accurate and thorough analysis of the senses of words and phrases. The book was as pronouncedly literary in its character as Bailey's was technical. Between the publication of Johnson's Dictionary and the first edition of Webster's in 1828 many minor dictionaries were published. The most notable of these were the pronouncing dictionaries of Kenrick (1773), Walker (1791), Perry (1775), Sheridan (1780), most of whom were actors or elocutionists. Walker's dictionary became very generally accepted as an authority, and ran through thirty or more editions before it was finally supplanted by Webster's dictionary. Smart published, first in 1836, an edition of Walker, entitled *Walker Remodelled: a new Critical Pronouncing Dictionary.* James Buchan, in his dictionary published in 1757, was probably the first to indicate the full pronunciation of the vocabulary words.

Webster's first dictionary was a small octavo book published in 1806, and this was followed (1828) by his *American Dictionary of the English Language*, to the preparation of which he devoted twenty years of zealous work. Webster treated lexicography as a science as well as an art; he emphasized its historical character, and gave a new importance to the etymologies; he covered both literary and technical terms; he first divided words so as to indicate to the eye, as nearly as might be, the true pronunciation; he recognized the viciousness of the conventional spelling of many English words, and adopted various simpler spellings which he considered to be justified by the analogies of the language, such as those with the endings, *-er, -ic, -or, -ize*, instead of those with *-re, -ick, -our, -ise.* Webster himself published also the second edition of his work in 1840; but the next edition, that of 1847, was brought out by a publishing house which has continued the revisions in an unbroken series, each based upon the next preceding edition, these revisions consisting of: the *Unabridged* of 1864; the *International* of 1890, and the *New International* of 1909, with various intermediate editions, under the same titles, having new matter in the form of appendices or supplements.

Since the publication of Webster's dictionary in 1828, various other important dictionaries have been made. The dictionary of Charles Richardson, published in 1836, was an original work very valuable for its abundant quotations from standard English authors, which constituted the chief distinction of the work. About 1850 was published *The Imperial Dictionary of the English Language*, edited and largely written by John Ogilvie, a Scottish schoolmaster, who took Webster's book as his basis, but added to it very extensively, giving the work a somewhat encyclopedic nature. From 1889 to 1891, the *Century Dictionary*, with William D. Whitney as editor-in-chief, was published in parts appearing at short intervals. This in turn was based upon Ogilivie's dictionary, and carried its encyclopedic features still further. Joseph E. Worcester, who was trained in lexicography by Webster, compiled various small dictionaries between 1830 and 1859, in which year his quarto dictionary was published. This, for a time, disputed the field with Webster as an authority on the pronunciation of words. No revision of this book has been published, but an edition with a considerable supplement was published in 1881. The *Standard Dictionary* was originally published (1893–1895) in two consecutively appearing volumes. This work was begun with the plan of using the 1847 Webster as its basis: but later this plan was given up; the historical treatment of words was abandoned; the etymology reduced nearly to Johnson's brevity; and citations from classical English authors were replaced with quotations from more modern, though often less careful writers. Hunter's *Encyclopedic Dictionary* (1879–1888) is a large work of an encyclopedic nature, edited, and largely written, by Robert Hunter, a Scottish author. This work contains an ill-digested mass of material, and is chiefly valuable for its suggestiveness.

In 1884 appeared the first section, or part, of the Oxford English Dictionary, entitled *A New English Dictionary on Historical Principles*, which all-in-all is the greatest dictionary ever published in any language. This work, which is founded mainly on material gathered by the English Philological Society, has been edited by Sir James A. H. Murray, assisted in the later parts by Dr. Henry Bradley and by William A. Craigie. It is almost purely philological and literary in character, giving exhaustive information as to etymologies, and often as to pronunciations; the senses are minutely analyzed and treated according to their historical development, with a multitude of citations dated and referred to their sources by page, author, and book title.

Besides these general dictionaries, there are various special etymological or dialect dictionaries, of which Rev. W. W. Skeats's *Etymological Dictionary of the English Language* (1898) and Dr. Joseph Wright's great *Dialect Dictionary* (completed in 1905), are too important to be passed over without mention.

The dictionaries of Webster and preceding lexicographers were practically one-man compilations. Webster defined all the terms in his dictionary himself, made or compiled the etymologies, and indicated the pronunciations, with only occasional assistance obtained from others and the help of the few paid assistants who were little more than copyists. This was also true of preceding lexicographers. To-day, no general dictionary worthy of any credence is made in this way or by general revisers alone.

The Dictionary as an Authority. — Much has been said and written about the credibility of the dictionary, and for and against accepting it as a final authority in disputed questions. The modern unabridged dictionary, made by a corps of trained editors and specialists, is nearly always correct so far as it goes, though it may likely enough fail to record all the facts about a particular question. Some mistakes are inevitable in any such work; but care and repeated verification have reduced the chance of error to a minimum. In matters of opinion, however, dictionaries may differ more or less, according to the light that the editor had in deciding the matter in question, or according to the standard adopted by him in making his decisions, as especially in pronunciation and spelling. Thus, if the dictionary gives a certain pronunciation for a word, it is morally certain that that pronunciation is used by a certain portion of the better educated people; but whether this particular pronunciation is the best pronunciation is a matter of opinion, depending upon what is accepted as the best usage. The same is true of any particular spelling of a word that has more than one spelling in good or reputable usage. In these matters, therefore, some one or more books must be chosen as the standard, or standards. But even in matters of opinion, the editor of a dictionary who is specially trained in his work and has at his command special information is exceptionally qualified to decide intelligently and correctly. Therefore, where two different works in good standing give the preference to different spellings, or to different pronunciations, the fact probably is that both these works record reputable usage. There is, however, a decided convenience in accepting some one book as final authority either for class instruction or for one's own personal guidance. See ENGLISH USAGE; SPELLING.

The School Use of Dictionaries. — With respect to the large, or unabridged, dictionaries, the same qualities that fit them for general use also fit them for school use. Such a dictionary, to be the most useful, should give in the most easily accsessible manner whatever information about words, or phrases, or names, that is needed by a person to use the word, phrase, or name correctly, or that is needed by a reader or hearer to understand best the context in which it occurs. The qualities of such a work are: accuracy, clearness, aptness, and fullness of information; and fullness of vocabulary. The most important of these qualifications, and the most difficult for any one but a trained dictionary worker to judge of, is accuracy.

A large or unabridged dictionary may be made by a corps of trained dictionary workers and specialists; or it may be made by liberal copying from works now in large part obsolete and often erroneous, such as the early (1828 or 1847) editions of Webster's dictionary, Ogilvie's *Imperial Dictionary*, or Hunter's *Encyclopedic Dictionary* mentioned above, both of which works have been liberally used, without credit, in this way in the making of various dictionaries now on the market. Neither teachers nor boards of education ordinarily can make the examination that will detect this; and no one can have the universal information that will, without investigation, enable detection of inaccuracies and general out-of-date-ness which become so glaring when investigation has been made. A few up-to-date definitions and a colored plate here and there easily lend a deceptive appearance of thoroughness and accuracy. It may safely be said, however, that any unabridged dictionary reliable as accurate must now be made by a corps of men trained in dictionary work, coöperating with a body of scientific specialists who define or revise all the terms in their respective departments. Any unabridged dictionary, therefore, is without the primary requisite of accuracy if its technical terms are defined by general revisers rather than by specialists. If in any work all the terms in the several sciences have been revised by specialists, it is safe to assume that that fact will be stated, and the names of the scientists given; and it is equally safe to assume that when this is not done the work has been made by copying other, usually obsolete, publications.

Clearness is essential in the typographical form as well as in the presentation of the subject matter. The type impression should be clear, and the symbols used easily intelligible to the average pupil. The typographical arrangement should be simple, so that the pupil will know where to look for a term. A feeling of uncertainty as to whether a word or phrase will be found in one place or another is often sufficient to deter a child from looking up its meaning, though he should have done so to prepare his lesson properly. The form of statement in the definition should be clear, and not involved. In this respect verbiage, as well as distinctions not involving a material difference in meaning, tend to confuse the student.

Encyclopedic information which is closely connected with the meaning of a word is an advantage to the more advanced, and often renders clear a definition which could not be briefly and clearly expressed without it. Many terms that are looked up have some special application or relation, the statement of which, though encyclopedic, is the main thing for which the dictionary is consulted. Such information, when not properly separated from the definition itself, may result in confusion. Under this head may be included the kind of information given in synonyms. Such matter cannot usually be incorporated into the definitions; but it is one of the important functions of the larger, especially of the unabridged dictionaries, to furnish such information.

The size of the vocabulary or number of terms defined in a dictionary is of great importance up to a certain limit, beyond which it becomes a matter of relatively minor consideration. It is quite important that the large dictionary should contain all of the words that are likely to be looked for; and if it can be made to include more than these, so as to meet practically every call made upon it, that is a decided advantage, if other essentials are not sacrificed. The one-volume dictionaries are practically limited to their present size, and further enlargement of the vocabulary is necessarily accomplished by various methods of condensation in typography, definition, etc.

Any teacher can satisfactorily determine the questions of clearness, aptness, and fullness of information, and of size of the vocabulary, by a word-for-word comparison of one dictionary with another. In fact, such a method carried far enough will determine, as well, the relative accuracy of two books, if the differences noted are carefully investigated.

The smaller dictionaries best suited for school use must differ somewhat from those best suited for general use. The small school dictionary must contain definitions that will be brief enough to admit of the book's being kept within a certain size, limited by the matter of price, and yet must be plain and full enough to convey the general idea of the meaning of the terms defined to an immature pupil ignorant of their meaning. Definitions that would answer well enough for the pocket dictionary for general use often will not answer as well for the smaller school dictionaries. Etymologies also are of more importance in some of the smaller school dictionaries than they would be in a dictionary of the same size for general use. Aside from these considerations, the same qualities are to be demanded as in the unabridged school dictionaries. The character of any small dictionary may be readily determined by a careful examination and comparison with a trustworthy unabridged dictionary.

The use to which a dictionary should be put in school depends largely upon the advancement of the pupil. The subject matters concerning which information is sought in the school dictionary are: spelling, pronunciation, meaning, and etymology. The goal that should be aimed at is to have the child know with fair exactness the meaning of every word used in his lesson of the day, either in the book or in his own presentation of it. For the primary grades this is, of course, impossible. Every young child has a general idea of the meaning of many words which he uses constantly, and yet he is unable accurately to state their meanings. To compel such a child look up every word used of which he could not tell the meaning would delay his progress in study, and burden his mind with a mass of definitions which he will better acquire more slowly. Real definitions of these words would usually involve the use of other words with senses unknown or uncertain to him, and the statement of ideas which he would be unable adequately to comprehend. In the primary grades, therefore, reference to the dictionary must be mainly for information as to the spelling, or the pronunciation, or to get such a general sense of a word as is conveyed by a simple synonym or a brief (though inadequate) definition. In other words, the meanings of difficult words must be merely translated into simpler ideas. With the advance in studies a dictionary with fuller and more precise definitions is needed. The pupil's vocabulary has grown so that he is able to grasp a more accurate analysis of the sense of a word or phrase. He is also beginning to understand the fact that words grow or develop from other words. Here some explanation from the teacher will be of assistance. The literal etymological sense of a word may be such as to throw light on the sense in which it is used, or may be of lively interest as suggesting some character of the thing named. The pupil still further advanced, the high school boy or girl, is learning from his books that man's history is not only a long one, reaching back into antiquity, but that the ideas and customs and doings of our present day are closely affected, indeed, often determined, by what previous races have done and been. In other words, he is developing a sense of the meaning of history. Here the dictionary may be made a real help in furthering this development, which is slow enough at best. The teacher may point out that the English vocabulary is polyglot, recording the influence upon the English people of the races with whom they have come into contact. Then the etymology of a word becomes a thing of real interest, not the technical etymological changes that have taken place (though these may, too, have such interest), but the general historical sense of the word. So the historical treatment becomes of importance. The fact that the language has changed and developed along logical lines in the past may be made plain by pointing to the history of the sense development of the words. Innumerable things of real interest present themselves. These things will not be seen unaided, but a hint here and a help there will arouse in most pupils an unfailing and lively interest in the language which they use. Even the studies in which they are engaged consist largely in the learning of the meanings of words, and the relations of these meanings to each other, as in rhetoric, grammar, arithmetic, botany, chemistry, geology, etc. The history and meanings of terms, then, is a stepping stone to the history and meaning of the great movements of the human race in time.

But it is not words alone of which the scholar may learn the significance in the dictionary. Historical events and characters get conventional names: Berlin Decree, Thirty Years' War, Ecumenical Councils, Holy Roman Empire, Ausgleich, White Russians, Little Englanders, etc. If the "dictionary habit," when acquired by a student, means only the satisfaction of his curiosity as to the meanings of this word or that, it is of but trivial importance. If it means to him the acquisition of a knowledge of the meanings of words and names, and of the relation of these meanings to each other so as to enable him best to understand the exact and full significance of English literature, he has acquired an invaluable accomplishment. There are, however, few pupils who will do this without material aid and guidance by the teacher.

F. S. A.

DIDACTIC METHOD. — The method of instruction, as contrasted with the method of development (*q.v.*). More particularly, that method of moral education, which attempts to teach morality through direct ethical instruction, as opposed to indirect and incidental moral training. The didactic method lays its main emphasis upon precept, principle, doctrine, and rule, rather than on example, habit, etc.

See Direct Methods of Teaching; Instruction; Moral Education.

DIDACTICS. — The science or art of teaching. In the seventeenth century, there was a general search, in philosophy, science, and education, for some one single, comprehensive method which could be substituted for the empirical variety of rule of thumb methods perpetuated by tradition and custom. Largely through the influence of Comenius (*q.v.*), the term "didactics" was introduced to designate the one method as manifested in teaching. In this country, the term "general method" has come into common use as a substitute for the term "didactics." In Germany, where the terminology of pedagogical theory has been highly elaborated, especially in the Herbartian school, the term *Didaktik* is employed to designate one division of the many fields into which pedagogy in general is subdivided. J. D.

See Method, General; Pedagogy; Philosophy of Education; Methods, Teaching.

DIDEROT, DENIS. — Born at Langres, France, in 1713, and died in 1784. Educated by the Jesuits, he became a bitter enemy of Rome and Catholicism, and led a vagabond kind of life, which was not improved by his marriage (1743). In fact, his domestic life was irregular and unhappy. But, in spite of all, Diderot lived a useful life, and made many important contributions to philosophy and education. His works reveal the marvelous versatility of his mind, consisting, as they do, of translations, stories, plays, essays, philosophical criticism, and original compositions. A list of his chief works is given below. Here must be noticed those which were more or less intimately related to education. The great monument of his career was the *Encyclopédie, ou Dictionaire raisonné des sciences, des arts et des métiers*, in twenty-eight volumes (1750–1772). This great work provoked the opposition of the Roman Catholic Church, and was suppressed in 1750. It dared to assume the principle of religious toleration and freedom of speculation, and argued that the principal concern of government was the welfare of the common people. Many of his collaborators, including D'Alembert and Rousseau, deserted him when official support was withdrawn from the enterprise; but Diderot continued its publication in a clandestine manner, writing thousands of the articles himself. His chief contributions to the science of pedagogy were two treatises, entitled *The Systematic Refutation of the Book of Helvetius on Man* (1773), and his *Plan of a University*, written, in 1776, at the request of Catherine II of Russia. In these works the following positions are maintained: (1) Instruction is necessary for all, should be compulsory, and therefore under the direction of the State. (2) The curriculum of secondary instruction (Faculty of Arts) needs to be revised, useless studies dropped, and a better balanced system employed. He severely criticized the traditional system in which (to quote his own words) " not a word on natural history, not a word on real chemistry, very little on the movement and fall of bodies, very few experiments, still less of anatomy, and nothing of geography " is heard. (3) He proposed the following reforms of these " abuses." First, *utility* should be the measure of values in the subjects of schooling. Second, the *sciences* are to be preferred for purposes of teaching. Of the eight divisions in the Faculty of Arts, the first five are devoted to mathematics, mechanics, astronomy, physics, and chemistry. Grammar and the ancient languages are assigned to the last three years. (4) His *Plan of a Russian University* included these further novelties: the division of the classes into several series of parallel courses, scientific and literary, religious, ethical and historical, æsthetical, etc.; history should be taught, beginning with the most recent events and working backwards to antiquity; reading and æsthetical culture must be earnestly studied because they are among the most agreeable and necessary elements of life. In addition to these propositions, it is to the credit of Diderot that he was one of the first to suggest the possibility of teaching the blind through the sense of touch. See his *Letter on the Blind*, in which he showed the dependence of men's ideas on the five senses, and demonstrated the relativity of all knowledge. In the *Letter on Deaf Mutes* he argued that æsthetical study was a valuable aid in promoting that variety of talent and adaptation in which all successful achievement consists. It is plain that these philosophical views reveal all the contradictions of the time struggling with each other. Nevertheless, they prepared the way for the more systematic work of later thinkers. Diderot was not a dogmatist; his gift lay in brilliant and somewhat shallow criticism. He was, as John Morley says, " above all things interested in the life of man, not the abstract life of the race; in the relation of real and concrete motives in this or that special case." Hence his contributions to the science of education lack the permanence which they might otherwise have acquired. H. D.

(For portrait, see opp. p. 307.)

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Morley, John. *Diderot and the Encyclopædists.* (London, 1905.)
Encyclopedia Britannica, s.v. *Diderot.*
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DIESTERWEG, FRIEDRICH ADOLF WILHELM (1790–1866). — One of the foremost German educators of the nineteenth century; was born at Siegen, Westphalia, and studied mathematics, philosophy, and history at the universities of Herborn and Tübingen. As a private tutor in Mannheim (1811), he attempted to apply Pestalozzi's method of teaching mathematics. Later on (1813), as a teacher of the Frankfort model school (*Musterschule*), he was largely influenced by De Laspée, Gruner, and other direct disciples of Pestalozzi. In 1818 he took a position at the Latin school in Elberfeld, where he met Wilberg (*q.v.*), a highly inspiring teacher, from whom he learned the secret of the Socratic or heuristic method. It was largely Wilberg's example which induced him to devote his life to the cause of elementary education. In 1820 Diesterweg was appointed as a director of the newly established teachers' seminary at Mörs in the Rhine province. At the head of this institution he passed twelve of the most active and fruitful years of his life. The course of study which he worked out for this school became a model for all other Prussian training schools, and thus shaped the preparation of Prussian teachers for a quarter of a century, being then superseded by a much narrower and less enlightened course. In consequence of the reputation which he had earned in this position, Diesterweg in 1838 was called to a larger field of activity by his appointment as director of the new Berlin Teachers' Seminary (*Königliches Seminar für Stadtschullehrer*). In connection with the seminary he established a practice school, and through this he revolutionized the methods in the Berlin elementary schools.

Diesterweg's activity, however, was by no means confined to his own institution, or to the city in which it was established. He traveled all over the country, addressing teachers everywhere, organized associations of teachers, and published a number of excellent textbooks which introduced new methods of teaching arithmetic, geometry, reading and language, and other subjects. To disseminate his ideas still more widely, he had established (in 1827) the *Rhenish Journal of Education and Instruction* (*Rheinische Blätter für Erziehung und Unterricht*). For this paper, which he edited until his death, he wrote many articles on the fundamental principles of education, on special methods, and on the necessity of raising the intellectual, social, and economic status of the elementary school teacher.

The cardinal idea of his pedagogy was the principle of self-activity, and he was himself a brilliant exponent of it in practice, as is known from the testimony of some of the teachers whom he trained at Mörs and in Berlin. He insisted on starting with clear sense perceptions, on proceeding from the known to the unknown, and on elaborating general principles through the free mental activity of the child, who was to be the center of instruction, rather than the teacher or the subject. He also strove to emancipate the school from the domination of the Church, advocating expert lay supervision and a free religious instruction, based not on dogma, but on ethical principles. For this reason he was also opposed to denominational schools, which still are the rule in most parts of Germany. It was inevitable that Diesterweg's fearlessness in fighting for these liberal ideas should bring him into conflict with the educational authorities of the State, especially when, after the accession of Frederick William IV in 1840, the party which tried to restrict popular education to the minimum gained the ascendency. In 1847 he was deposed from his office, although still left in the possession of his salary. His enforced leisure he used for the further propagation of his educational ideas by word and pen. In 1858 he was elected a member of the Prussian legislature, where he untiringly worked for the freedom of the school and for the betterment of the condition of the teacher. His seventy-fifth birthday was celebrated with great enthusiasm by teachers all over Germany; soon after he died at his home in Berlin.

Diesterweg clearly recognized the social function of the school. His ideal aim was the uplifting of the masses of the people through a practical, moral, and religious education. The necessary means to this end was the creation of a real teaching profession, therefore he became a teacher of teachers. He was a follower of Pestalozzi, but, unlike him, he was a practical teacher of rare ability, and thus able to reduce Pestalozzi's theories to workable methods for the classroom. His work for German education may well be compared with that of Horace Mann for American schools. Both were great educational agitators, and both had at times to encounter the most bitter opposition, but while Mann's fame rests chiefly on his ability to organize education and to rouse public opinion in its support, most of Diesterweg's work was of a strictly professional character and of direct influence on the teachers. The best systematic exposition of his ideas is found in his *Wegweiser für deutsche Lehrer* (*Guide for German Teachers*), published in 1834 in collaboration with a number of other teachers, who wrote some of the parts on special methods. As the best application of his methodology, he himself considered his *Populäre Himmelskunde* (*Popular Astronomy*), Berlin, 1841.

For a complete bibliography of Diesterweg's writings, see the edition of his *Rheinische Blätter* by A. Chr. Jessen in Lindner's *Pädagogische Klassiker*, Vol. VI, Vienna, 1879. F. M.

(See portrait, opp. p. 580.)

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DIET. — See Food; Nutrition; School Lunches.

DIETETICS. — See Household Arts.

DIFFERENCE TONES. — See Combination Tones.

DIFFERENTIAL CALCULUS. — See Calculus.

DIFFERENTIATION OF FUNCTIONS. — In the course of animal evolution special organs have been set apart for the more complete performance of certain particular functions. Thus an organ has been set apart for the reception of light stimulation. This organ, the eye, has been differentiated from the general surface of the body, which is at all times somewhat sensitive to impressions produced by light. In the same fashion the ear has been differentiated from the rest of the body as the organ especially adapted to the reception of sound stimulations. Differentiation of organic functions is advantageous, because it makes possible a higher degree of sensitivity and a higher degree of perfection in each of the differentiated functions. There must, however, be in connection with this differentiation some central organ which shall unify all of the different functions so that they shall coöperate in individual life. Differentiation of functions has taken place during the process of organic evolution, and is not carried further during individual development. The processes of individual development are processes of organization and integration rather than processes of differentiation. C. H. J.

DIFFERENTIATION OF STUDIES. — The process of classifying experience into its characteristic aspects; the development of the child's knowledge so that it becomes manifest to him as the various school subjects. Sometimes the differentiation, so far as the classification of the curriculum is concerned, is temporary, as in the case of penmanship, which appears with the need to write in the first grade and disappears with approximate mastery in the fifth or sixth school year. Again the differentiation is continuous, appearing whenever certain experiences are felt to be closely related; and further differentiation follows a larger massing of knowledge and the ensuing necessity for further subclassification. Thus, nature study, which is pursued in the lowest school years, is differentiated into geography and elementary science; later, science becomes the physical and biological sciences; and later still biological science becomes botany, zoölogy, etc. H. S.

See Correlation; Course of Study.

DIFFUSION. — The undeveloped nervous system is made up of cells which are devoid of branches. The absence of branches makes it possible for energy to enter and escape from these cells in various directions. The result of this absence of definite paths within the nervous tissues is that the muscles of the body are thrown into irregular and inharmonious contraction by motor impulses coming in all directions from the undeveloped nerve cells. In like manner the sensory impulses which enter into the undeveloped cells become confused and intermingled. The whole situation is described by the term "diffusion." As nerve cells develop definite branches, and as paths of transmission are organized through the nervous tissue, the organism becomes coördinated. (See Coördination.) Combinations of sensory impulses become regular and precise. The transition from diffusion to coördination is admirably illustrated in the development of the writing habit. At first movements are excessive, distributed over all the muscles of the body, inharmonious, often antagonistic, and utterly confused. As development goes forward, the excessive movements disappear, the inharmonious elements of finger and hand movement disappear, and diffusion gives place to regular, well-defined activities. The same formula applies to sensory experiences. Let one go into a new complex experience. At first the impressions are entangled and confused. There is a mass of conflicting sensations. In the course of time, if experience is allowed to develop, these impressions are organized so that each calls up its appropriate activity and stands in its proper relation to its fellow. Here, again, diffusion gives place to order and organization.

The statement thus far assumes that the nervous system is at some time wholly undeveloped. This is of course not true. Certain centers are wholly undeveloped, but large areas of the nervous system of all the higher animals are developed through inheritance (see Instincts), consequently absolute diffusion never appears. Even the instincts, however, show a degree of diffusion in their first manifestations.

See Coördination. C. H. J.

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DIFFUSION OF USEFUL KNOWLEDGE, SOCIETY FOR THE. — This society arose out of the suggestions of Lord Brougham (*q.v.*), contained in his *Practical Observations upon the Education of the People*, for the encouragement of good reading among the working classes. The aim of the Society, which was organized in 1825 through the efforts of Lord Brougham, was to publish good literature at a price which would bring its volumes within the reach of workingmen. The first volume appeared in 1827.

See article on Brougham.

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Edinburgh Review, June, 1827.

DIGGES, LEONARD, THE ELDER. — One of the leading mathematicians of Queen Elizabeth's reign, who belongs to the gentlemen amateur students of the subject. He was said to be the best " architect " of the age, excellent at fortifications, and to have anticipated the invention of the telescope. He wrote: *A geometrical Practice named Pantometria, divided into three books, Longimetria, Planimetria, and Stereometria, containing Rules manifolde for mensuration of all lines, superficies and solides*, 1571 (edited and finished by his son, Thomas Digges). In this book the theodolite is for the first time described. Thomas Digges, his son, added to his father's writings. His own works (24 volumes in number) are noteworthy as the earliest books in which spherical trigonometry is used in England. F. W.

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DIGIT. — See Numbers.

DIJON, UNIVERSITY OF. — Founded in 1722 by the then Duke of Bourbon, and sanctioned by Papal bull in 1723. Only a law faculty was maintained. Financial support was given by the faculty, and when the university was suppressed in 1793 it was materially well established. A law school was re-created in 1804, and became a faculty in 1808; faculties of science and letters were established in 1810, and medicine was taught there from 1826. The university was created by the French University Act in 1896. The faculties of law, science, letters, and a preparatory school of medicine and pharmacy are maintained. In 1910 there were enrolled 1015 students, of whom 625 were in the law faculty.

See France, Education in.

DILLINGEN, THE UNIVERSITY OF, BAVARIA. — The first of the Catholic universities to be established in the sixteenth century, having been founded by the Bishop of Augsburg in 1549. For a time Dillingen was the intellectual center of Catholic Germany, but gradually declined in importance, until it was finally disbanded in 1803. It has a direct descendant, however, in the Royal Bavarian Lyceum, organized in 1804, which offers a four-year course in Catholic theology. There were 141 students in attendance in 1910.

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DILWORTH, THOMAS. — An English textbook writer who wrote *A New Guide to the English Tongue*, about 1740, which held a high place in the schools, in which English was taught, for the next half century. The book includes a spelling book of " common and proper words" from one to six syllables, words same in sound and different in signification, a short grammar, a collection of sentences in prose and verse, divine, moral, and historical, together with some short fables; and forms of prayer for children. The whole is designed " for the use of schools in Great Britain, Ireland, and in the several English colonies and plantations abroad." It is dedicated to the promoters of the charity schools of Great Britain and Ireland, by Dilworth, dating from Wapping School, June 13, 1740. There is a list of names and schools of over 100 clergymen and schoolmasters who declare that Dilworth's book is " the best of its kind that hath been made public." It does not seem improbable that Dilworth's book was thus the widest circulated and most remunerative English grammar of the latter half of the eighteenth century. There are rough cuts for the select fables. About 1743 Dilworth followed up his textbooks for English by *The Schoolmaster's Assistant, being a Compendium of Arithmetic both Practical and Theoretical.* This, he says on the title-page, is recommended by eminent mathematicians, " to be used in *all* schools." It is dedicated to " the reverend and worthy schoolmasters in Great Britain and Ireland," and is designed " to take off " from them " that heavy burden of writing out rules and questions which you have so long laboured under." He has followed the catechetical method of question and answer, " because children can better judge of the force of an answer than follow reason through a chain of consequences." Dilworth includes an *Essay on the Education of Youth*, in which he says that " a year's education in writing is, by many, thought enough for girls' education," and this often delayed until eighteen or twenty years of age, and pleaded for girls to go to school as early and stay as long as boys. Over fifty schoolmasters, with names and schools given, recommend this book " as the *only one* for the purpose (*arithmetic*), that hath been made public." Apparently Cocker's *Arithmetic* (*q.v.*) was no longer in use. The rules and examples are given, but there is no rationalized theory of the processes. The multiplication table goes up to nine only. Dilworth also wrote textbooks on the *Terrestrial and Celestial Globes* and the *Young Book-keeper's Assistant.* F. W.

DINTER, GUSTAV FRIEDRICH (1760–1831). — A distinguished German clergyman and educator. Born at Borna, Saxony, and educated at the *Fürstenschule* in Grimma, he studied philosophy and theology at the University of Leipsig, and then became pastor of a village near Borna. His interest in education was so great that he took a number of poor but talented young men into his house to train them for teachers, not only giving them free instruction, but also boarding, lodging, and clothing them at his own expense. In 1797 he was appointed principal of a newly established normal school at Dresden with which an elementary school was connected. On account of his health he retired from this position in 1807, and became again a country pastor, without, however, giving up his educational activity. In 1816 he was called to Königsberg as inspector of the schools of the province of Prussia, to which position was added the chair of Pastoral Theology and Morals in the university. Dinter was of great influence on the development of the German elementary school, where he was one of the first to introduce the ideas of the philanthropinists and of Pestalozzi. His methods of religious instruction were specially valuable. Among his writings, which have been edited by Wilhelm (43 vols., 1840–1852) the most important are his *Schullehrerbibel* (*Bible for Schoolmasters*), a model of the Socratic method, *Die vorzüglichsten Regeln der Pädagogik* (*Chief Rules of Pedagogy*), and his very interesting *Autobiography.* F. M.

(See portrait, opp. p. 582.)

DIOCESAN SYSTEM IN EDUCATION. — See Bishops' Schools; Canon Law in Education; Church Schools, etc.

DIONYSIUS. — Early Christian writer, born in Alexandria about 200 A.D. into a pagan family of wealth and rank. Early in life, after investigating various philosophies, he fell under Christian influences in the catechetical school (*q.v.*) of his native city, which had attained its highest renown under the leadership of its greatest teacher, Origen (*q.v.*), whose most eminent pupil he became. In 232 he succeeded Origen as Director of the Alexandrian School, filling this position with marked ability for sixteen years, and winning world-wide recognition as the foremost educator of his time. So great was his influence that Athanasius (*q.v.*) described him as " the Teacher of the Church." Alexandria had succeeded Athens as the chief center of learning and philosophy, and had become the battle ground of Christian thought. Its famous library and museum attracted scholars from all over the world. Its catechetical school, founded by Pantænus (*q.v.*), and modeled after the philosophical schools of Greece, had been built up by its great teachers, Clement (*q.v.*) and Origen (*q.v.*), to a position of world-wide influence. They held that all truth is precious, whether gained from Christian or heathen sources, regarded all which had been well said by the Greek philosophers as given by divine revelation, and welcomed their aid in working out the great problems of religious thought. They wore the mantle of the philosopher, and taught the systems of Greek philosophy to their classes, especially the Neo-Platonic, which was dominant in their day. In opposition to the Augustinian view of the transcendence of God, they insisted upon the divine immanence, conceiving of God as indwelling in the world as a spirit dwells in a body. They regarded all life as an education of the soul, and considered culture as closely related to faith. They emphasized the inherent worth of the soul as made in the image of God. Following these lines, Dionysius gave much attention to the condition of the soul after death, and taught the existence of an intermediate state as a school in which departed souls are prepared by an intellectual fire for the heavenly life, thus laying the foundation for the later ideas of purgatory. The Alexandrian School existed for the purpose of instructing adults in all the learning and literature of the past and in the doctrines and usages of Christianity, training clergy and teachers for their work, and preparing believers to meet the arguments of heathen controversialists. Instruction was chiefly catechetical, somewhat after the Socratic method, but was also given in the form of lectures. The curriculum comprised all the elements of general culture, while the Bible and Christian doctrine were made the subject of close and accurate study, in both their theoretical and their practical bearings. From 247 to 265 Dionysius was Bishop of Alexandria, then the greatest and most influential see in Christendom, filling this high position with such rare wisdom, moderation, and fidelity that he has ever since been known as " Dionysius the Great." He took a prominent part in the settlement of all the controversies of his day. He wrote much, but only a few fragments of his controversial works have been preserved, chiefly in the *Ecclesiastical History* of Eusebius. A translation of these may be found in the *Ante-Nicene Fathers*.

W. R.

See CHRISTIAN EDUCATION IN THE EARLY CHURCH; also CATECHUMENAL SCHOOL; CATECHETICAL SCHOOLS.

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DIOPHANTUS (DIOPHANTOS, sometimes spelled **DIOPHANTES).** — The leading algebraist of the Greeks. He seems to have flourished about 250 to 300 A.D., at Alexandria, but these dates are quite uncertain. We know of three works written by him: (1) thirteen books on *Arithmetic*, (2) *On Polygonal Numbers*, (3) *The Porisms*. Of the arithmetic, only six books are extant. It is possible that the treatise on polygonal numbers is one of the original thirteen books of the arithmetic. The *Porisms*, probably a collection of propositions relating to the properties of numbers, is lost. The arithmetic relates almost entirely to indeterminate equations of the second degree (Diophantine equations), although the first book treats of determinate linear equations. Diophantus uses symbols for the various powers of the unknown quantity, the first degree being represented by a symbol resembling the accented final sigma, the second power by $\delta^{\hat{\upsilon}}$ (for δύναμις, power), the third by $\kappa^{\hat{\upsilon}}$ (for κύβος, cube), the fourth by $\delta\delta^{\hat{\upsilon}}$, and so on. He used no symbol for addition or subtraction, but used an inverted truncated letter ψ for subtraction, and occasionally ι (for ἴσος, equal) for equality. We may therefore consider Diophantus as the earliest writer who devoted a treatise entirely to algebra, as one of the first to use algebraic symbols, as the first to give serious attention to indeterminate equations, and as the only conspicuous algebraist of the Greeks.

D. E. S.

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DIOPTRICS. — That portion of geometrical optics (*q.v.*) which treats of the refraction of light in or between different media. A certain study of dioptrics is valuable as a preparative for a study of the physiology or psychology of vision. According to the reduced eye of Listing, the various refractive media of the eye (cornea, aqueous humor, lens, vitreous humor, etc.) may, so far as their total converging effect is concerned, be considered as equivalent to that of a single substance with a refractive index of 1.35, and a single spherical surface of 5.1248 mm. radius. The distance between the nodal point of such a substance and its principal focus is 15 mm. It is equal to a convex lens with a focal distance of 2 cm. R. P. A.

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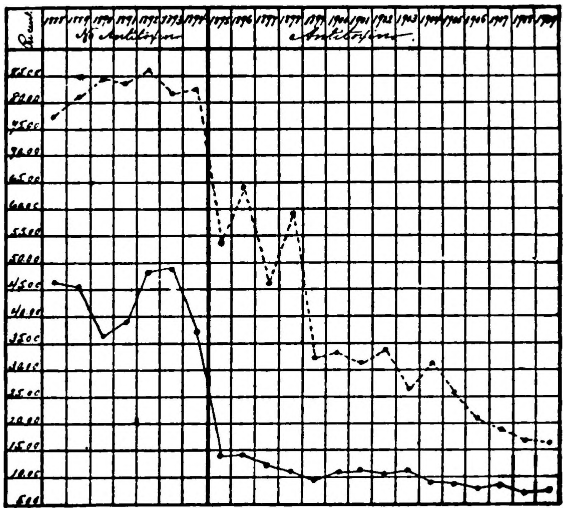
DIPHTHERIA. — A disease of the throat. As shown by modern hygiene, it is a personal disease, and is usually spread by direct contact with another individual who carries the germs. The disease is caused by the diphtheria bacillus. This was discovered microscopically by Klebs, and isolated and proved to be the cause of the disease by Löffler. Hence it is called the Klebs-Löffler bacillus. The incubation period is from two to seven days, usually from two to four days. Infectiousness continues as long as the Klebs-Löffler bacillus remains in the throat or nose, usually from ten to twenty-one days, although sometimes very much longer. The period of isolation for mild cases is perhaps ten days, for severe cases twenty-eight days, and the period of isolation for other members of the family who were removed immediately from contact with the patient is, in New York City, four days. The symptoms of a severe case are headache, fever, general depression of vitality; and a grayish-white membrane is likely to be formed on the tonsils or pharynx. In many cases, however, the symptoms are very slight, and the presence of a serious illness may not be suspected. Before the discovery of the Klebs-Löffler bacillus as the cause of the trouble, the disease was sometimes not carefully differentiated from croup. Probably most cases of so-called membranous croup were cases of diphtheria.

The most important remedy and means of prevention is the subcutaneous injection of the blood serum from an animal rendered artificially immune from the poison of diphtheria. This is the so-called antitoxin of diphtheria, and was discovered in 1894 by Behring, a pupil of Koch. Since the use of the antitoxin has become general, the mortality from diphtheria has decreased remarkably. In Boston the average ratio of mortality from 1876 to 1894, before the use of the antitoxin, was 14.25 per 10,000 of the population. The average ratio since the use of the antitoxin, from 1895 to 1909 inclusive, has been only 5.17. The decrease in mortality is well illustrated by the statistics gathered by Dr. McCollom at the Boston City Hospital.

In the school, diphtheria is a most serious disease, and very difficult to manage. The disease may be spread by means of common drinking cups, exchange of slates, pencils, or other utensils, and perhaps by the dust of the schoolroom; but all these methods are apparently insignificant as compared with the spread by direct contact with another person who carries the disease. Frequently a child who is apparently well may harbor the Klebs-Löffler bacilli in its throat, nose, or naso-pharynx, and the chief danger is likely to come from such cases. There are many slight cases of the disease which return to school in an infectious condition, or perhaps continue at school all the time. The Klebs-Löffler bacillus may remain in the throat or nose of the patient who has had the disease for a long period after recovery, sometimes for several months; and two cases have been reported where after a year, the bacillus was found.



Per Cent of Mortality of Diphtheria at the Boston City Hospital proper, and at the South Department, from 1888 to 1909, inclusive. Per Cent of Mortality of Intubations for the Same Time. From 1888 to 1894, no Antitoxin. From 1895 to 1909, Antitoxin.

Diphtheria = ——————   Intubation = ·························

The disease is more common in cold and temperate climates, and occurs more frequently in the autumn and early winter. The studies of Dr. McCollom, in Boston, show that the disease is much more frequent during the months of the school year than during the vacation months. As regards age incidence, extended investigations by Sir Shirley Murphy, based upon 1903 cases, indicate that the maximum incidence is at the age of four. In the London investigation it was found that diphtheria does not tend to spread in classes under the age of four or over the age of seven. The greatest danger of school spread appeared to be in classes where the children were between their fourth and seventh birthdays. Infants have a relative immunity against the disease, and the blood of older children and adults is supposed to contain an appreciable quantity of antitoxin. The great susceptibility between the ages of four and seven, it has been suggested, is due to the fact that children at birth have a certain immunity acquired from the mother, but this has disappeared by the age of three or four; and then, after seven, there is a relative acquired immunity.

There are many survivals of old ideas in regard to the treatment of diphtheria. It is usually supposed that it is always a severe disease, and hence the great danger that comes from "carriers" is ignored. Children are often permitted to return after an attack of diphtheria while still carrying the germs of the disease. Especially other well children who have come in contact with cases of diphtheria are likely to be ignored, although carrying the disease. School closure is often resorted to, and the children allowed to return to the school after a few weeks without any examination to prove that they are free from the disease; and great faith is placed in disinfection as a means of protection. This, without bacteriological examination, is of no avail. We disinfect the rooms and the furniture, but the disease germs are in the noses and throats of the children. Disinfection by means of sulphur is described by Dr. Kerr as "a procedure only to be classed with fetichistic incantations and medieval exorcisms." School closure as a means of checking diphtheria is likely to have but little influence; with competent medical inspection it seems better ordinarily to have the schools continued, because in this way the disease can be better controlled than when the children are on the streets and at home. Dr. Kerr in a recent report writes: "It has been shown that school closure ought seldom or never to be necessary in elementary schools owing to the prevalence of diphtheria. With modern technique it is possible to discover those who are spreading the disease, and to obtain their exclusion. The objections to school closure are that the 'carriers' are not discovered and isolated, and that there is not the least guarantee that, at the end of the period of closure, the children who are the cause of the spread of the disease will be innocuous. The closing of schools for diphtheria should be looked upon as a confession of impotence and defeat."

Frequently a number of bacilli morphologically similar to the diphtheria bacillus are found in the throats of children, but according to recent investigations these are nonvirulent, although they may, under certain conditions, cause sore throat. It was noted in the London investigations, that there is a certain relationship between the two organisms, and where diphtheria is most prevalent, the pseudo-diphtheria bacilli are found in greater abundance. The pseudo-diphtheria bacillus is probably, Dr. Kerr concludes, totally distinct from the diphtheria bacillus, but an organism of the same group affected by the same conditions and spreading in the same way from child to child. Although the morphological character of the bacillus is not identical with that of the Klebs-Löffler bacillus, it is difficult to differentiate between them.

Very important and significant studies of diphtheria among school children have been made in London under the direction of Dr. Kerr, the medical officer. The method is as follows: "Diphtheria returns are kept under continuous observation, and on any suspicion of school influence showing itself, my assistant visits the school, and all children giving any sign of ill health, such as aural or nasal discharge, enlarged glands, undue pallor, or a history of recent absence, have a small portion of mucus removed from throat or nose by a sterilized platinum wire, and placed on the surface of a tube with sterile blood serum. This is then cultivated in an incubator at 98° F. for fifteen to eighteen hours. The cultures are then examined microscopically, and any showing suspicious forms are then stained with Neisser's stain. Except in very rare cases this is deemed sufficient. Only cases showing Klebs-Löffler bacilli are counted as diphtheria; the pseudo-bacilli we neglect." (*Report of the Education Committee*, London, March, 1905, p. 25.) The carriers are then quarantined. For the year 1909 it is reported that "in every instance in which carriers were detected and excluded from the school there was a prompt cessation of cases of diphtheria."

The significant facts in regard to diphtheria are briefly as follows. The disease is usually spread by direct personal contact. The persons who are acutely ill with diphtheria are not the serious sources of contagion; for they are isolated. The most serious sources of contagion are the following: First, the perfectly healthy child who has come in contact with the disease and carries the germs. Second, children who are suffering from mild forms of the disease, not perhaps suspected by parents and teachers. Third, children who have had the disease, but have returned to school while still carrying the Klebs-Löffler bacillus. Daily medical inspection and school nurses to follow up cases in the home are imperatively necessary. And it is important that teachers should coöperate intelligently with medical officers in detecting cases of diphtheria. Any children that have sore throat, even of slight character, or irritating nasal discharge should be reported to the school physician. The only safe method of procedure seems to be the following. As soon as a case breaks out in a school, bacteriological tests of all the children should be made, in order to detect any possible "carriers." In case diphtheria has occurred in a household, all children in the family should be examined bacteriologically before being permitted to reënter the school. Children who have had the disease should not be permitted to return to school until a number of negative cultures has shown that the disease is no longer carried. The problem of dealing with diphtheria in the school is a very difficult one, because the only sure way seems to be the exclusion of all children who are "carriers." But this is likely to be strongly objected to by parents, who see no reason why children who are well should be excluded from the school. The loss of time from school work, however, and the serious character of the disease, and the satisfactory results likely to come from thorough-going investigation and rigorous exclusion of all cases showing a positive culture, seem thoroughly to justify such drastic measures, and teachers and the community should be educated to the need of a scientific method of handling the disease. W. H. B.

See Contagious Diseases.

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DIPLOMA. — Literally, a folded paper (Greek δίπλωμα). Originally this consisted of two wax-smeared tablets, closed and sealed, and conveyed a governmental license, recommendation, or passport. Soon the term came to be applied to all public or legal documents. At present, a diploma is a document conferred by a college, university, or learned or professional body to denote that the holder is entitled to some degree or privilege, for example, to practice law or medicine or pharmacy. Frequently a diploma is conferred by institutions which have not the power to grant degrees as evidence that the holder has attained a certain standard of efficiency in a study or course of studies.

See Degrees; College, American; Universities; etc.

DIRECT HEATING. — See Heating and Ventilation of School Buildings.

DIRECT METHODS OF TEACHING. — In the teaching of desirable facts, judgments, applications, etc., the teacher may have two distinct methods of bringing them into the possession of the pupil: (1) they may be directly given to the pupil, or (2) the pupil may be placed in a situation that will stimulate him to acquire the facts for himself. The first is called a direct method of teaching, or method of instruction; the second is called an indirect method of teaching, or a method of development. Such a classification is made from the standpoint of the teacher's activity. From the point of view of the learning process of the child, the indirect method of teaching is a direct method of learning, since he gains the fact through his own direct experience; and the direct method of teaching is an indirect method of learning, as the child gets the fact not by direct contact, but indirectly through the experience and knowledge of others. The tendency of the past has been in the direction of an overuse of direct methods of teaching, just as certain present reform tendencies tend to the overuse of indirect or developmental methods. The methods are supplemental rather than competitive. Efficiency would seem to demand a large use of indirect methods of teaching; but economy of time and energy, and the necessity for acquiring facts that the child cannot well experience at school, compel the use of the more direct method of instruction. Generally speaking, the indirect method is of greatest use with young children, in the beginning of new subjects, in making generalizations from concrete facts; while the direct method of instruction is most useful with mature pupils, in familiar subjects, and particularly in the domain of physical and moral welfare where the danger of mistake is serious.

The natural sciences lend themselves rather more readily to the method of development than do the normative studies. Nature study, arithmetic, and geography, favor the use of the indirect method of teaching, and history, civics, literature, morals, and the other humanities, lay increased emphasis on the necessity of authoritative instruction. H. S.

See Developmental Methods; Didactic Method; Instruction.

DIRECTORS, SCHOOL. — A term practically synonymous with School Trustees, when the district or rural school is meant (see District Boards of Trustees); or to City Boards of Education (*q.v.*), when referring to city schools. The term Board of School Directors is sometimes used in place of the more common terms, as for example the Boards of School Directors for the school townships of Iowa; the single School Director for the rural school districts of Indiana and Ohio; and the Boards of School Directors for the cities of Milwaukee and New Orleans. When applied to the managing boards of institutions, the term is synonymous with Boards of Governors, Boards of Regents, or Boards of Trustees. E. P. C.

See Boards of Governors.

DISAGREEABLENESS. — This term has come into common use for all emotional and affective experiences which are opposed to pleasure. The necessity of distinguishing between pain and disagreeableness arises out of the fact that pain is a definite form of organic sensation. There are special organs for the reception of pain stimulations, and pain is to be classified as a sensation with pressure and cold and heat rather than with the feelings. The popular contrast between pleasure and pain involves, therefore, a certain confusion in psychological descriptions. Agreeableness and disagreeableness, or pleasure and disagreeableness, constitute the more exact contrast in descriptive terminology.

See Feelings; Hedonism; Pain and Pleasure.

DISCIPLINARY CLASSES. — As the class system of organization in the elementary school becomes perfect, and compulsory attendance forces all children into the schools, numerous maladjusted individuals appear. Some of these are intellectual misfits; some have, through sickness or absence, lost touch with the school; and others present difficulties from the standpoint of discipline. A variety of special or ungraded schools have been organized, into which the above individuals may be fitted. Only occasionally have special schools been set apart for children of a disorderly or semi-incorrigible disposition. These may be dealt with in disciplinary classes, whose educational value consists in their segregating for special treatment, and under teachers specially qualified to deal with them, pupils who are not ordinarily reached by the treatment of the regularly organized classes. On the other hand, they are supposed to contribute much to the efficiency of the regular class, through having withdrawn from this a small percentage of pupils who impose an extraordinary task upon the teacher. There can be no doubt that special teachers can be found who can effectively handle them, and that the educational treatment may be very much better adapted to their needs. But the moral effect of segregating a considerable number of children from the uplifting influence of their fellows is questioned. Disciplinary classes sometimes fall into disfavor in the community, and it may be discovered that the harmful social effects resulting from segration may outweigh the educational values found in other connections. These classes have been organized, at least experimentally, in nearly all large American cities.

See Grading and Promotion; School Management; Interest; Retardation; Special Classes; Truant Schools.

DISCIPLINARY LESSON. — See Lesson.

DISCIPLINE. — The training that results in power, skill, or efficiency in any direction. It is sometimes used in a sense broad enough to cover the whole educative process, so far as that takes the form of systematic training. When mental faculties were recognized as innate, discipline often meant the series of practices through which these supposed innate powers were sharpened and perfected. (See Formal Discipline.) Since training of natural impulses and reactive tendencies involves some transformation of native powers through attachment to ends which they are not spontaneously pursued, the term "discipline" often carries with it a connotation of subduing or restraining natural inclination, and hence of a more or less painful constraint supplied from without. In this sense, the doctrine of discipline is opposed to the doctrine of interest (*q.v.*) and freedom. In a more adequate view, this phase of inhibition is seen to be the negative and temporary aspect of a constructive and positive process — the gain of power and efficiency (practical freedom) that ensues from training. There is, however, a regrettable tendency in education to make discipline in its negative sense an end in itself, instead of recognizing that there is genuine discipline only as there is gain in self-control and self-command. In its narrowest pedagogical sense, discipline means the system of rewards and punishments by which pupils are rendered amenable to the teacher's authority. J. D.

See Ability, General and Special; Formal Discipline; School Management.

DISCIPLINE, FORMAL. — See Formal Discipline.

DISCIPLINE, METHODS OF. — See School Management.

DISCIPLINE, SCHOOL. — See School Management.

DISCORD. — A dissonant combination of tones; the absence of harmony. Discord produces a craving for resolution into something more restful, satisfying, and final. The resolution consists in movement toward combinations of consonant tones. C. E. S.

See Chord; Consonance.

DISCOVERY, METHOD OF. — A term occasionally used for inductive methods of teaching, where the child manipulates his own objects or conducts his own experiments. Sometimes used as a term for the laboratory method of teaching through individual experimentation.

See Experiment, Teaching by; Inductive Method; Laboratory Method.

DISCRIMINATION. — In general, this term refers to the ability to hold apart in consciousness two or more elements of experience. Certain types of such ability depend upon the structure and development of organs of sense (see Auditory Discrimination; Visual Discrimination). In other cases, discrimination depends upon high forms of nervous and mental ability.

DISEASES OF DEVELOPMENT. — See Adolescence, Hygiene of; Morbidity.

DISEASES OF TEACHERS. — See Teachers, Health of.

DISEASES OF THE SENSE ORGANS. — See Ear, Hygiene of; Eye, Hygiene of; Nose, Hygiene of; Morbidity.

DISEASES, PERIOD OF INCUBATION OF. — See Contagious Diseases.

DISINFECTANTS FOR SCHOOL BUILDINGS. — In the first place, a clear distinction between a deodorant and a disinfectant is necessary. Deodorization is the mere neutralization of offensive odors. Disinfection is, on the other hand, the process by which pathogenic germs and infectious material are destroyed, or are rendered inert.

Natural Disinfection. — Nature has gratuitously provided a disinfectant of the first order, — direct sunlight is the most economical and practical of all germicides. Schoolrooms which are kept thoroughly clean and receive a thorough sunning each day are not likely to need much further attention in the way of disinfection. Cleanliness and sunshine are worth more than all artificial germicides that can be applied to schoolrooms, save in special emergencies.

Artificial Disinfection. — 1. *Sulphur Dioxide.* — This powerful disinfectant has a limited use on account of its lack of penetration. When moisture is present, it is very active in surface disinfection, which is often needed in those schoolrooms receiving little or no sunshine. It is easily applied, and the process by which it is generated is a simple one. The room should be tightly closed. A metallic pan or bucket, which can be heated, is partly filled with water and placed in the center of the room. Half immerse a vessel in this water by placing it on some incombustible substance, such as a brick. This last vessel is for the sulphur. Heat the water until it boils, and then set fire to the sulphur. The necessary sulphur dioxide will result. Sulphur dioxide should not be liberated in a room where there is tinted or gilt paper, and all colored maps, charts, etc., should be removed, because it will discolor them.

2. *Formaldehyde.* — Perhaps the most powerful of all the gaseous disinfectants now known is formaldehyde. This material and the methods of applying it are inexpensive. The methods of using this disinfectant recommended by physicians and boards of health, which are practicable in schoolroom disinfection, are as follows. (*a*) The permanganate method, *i.e.* forming formaldehyde gas by mixing 300 cc. of a 40 per cent solution of formaldehyde with 150 grams of potassium permanganate for each 1000 cubic feet of air space to be disinfected. The atmosphere of the room should be warm, and the room tightly closed. This method can easily be applied in cities, where the necessary chemicals can readily be obtained. An ordinary pan can be used in which to place the materials, and the reaction which follows will free the gas. (*b*) The Stewart method, which consists in thoroughly spraying the walls, floors, furniture, etc., with a 20 per cent solution of formaldehyde. This is a very effective method, but is more troublesome to apply. In the first of these methods, penetration is not claimed, and in the latter it is not sufficiently proved so that we may rely upon it wholly. However, if penetration is desired, it can be obtained by using formaldehyde mixed with the vapor of carbolic acid. In this way the tendency to polymerization is entirely destroyed. Dr. W. B. McLaughlin (*Scientific American,* S. No. 1706, Sept. 12, 1908) says, " The mixture which results in the best effects is 75 per cent of a 40 per cent solution of formaldehyde and 25 per cent of carbolic acid — 8 ounces of the mixture to 1000 cubic feet of air space." For the floors, doorknobs, handrails, etc., a 40 per cent solution of formaldehyde can be used. In the case of floors, clean sawdust saturated with this solution should be spread over them. This should be swept out before the sawdust becomes dry. This done once every eight weeks will, in general, keep the floors in safe condition. This method is extensively used in Boston at present.

3. *Bichloride of Mercury.* — Great care should be exercised in keeping this poisonous drug in the school building. It is often mistaken, on account of its colorlessness, for something harmless. It should be colored for identification. It can be bought in tablets already colored, each tablet containing a given amount, and from these it is easy to make the proper solution. It can be used in the schoolroom for disinfecting the furniture, floors, and parts of the clothing. For these purposes a 1:1000 solution is sufficient. It must not be brought in contact with metals, for it destroys them. An excess of albuminous substances interferes with its action, and for this reason it is not effective in disinfecting excreta.

For latrines the following will be found effective: (1) chloride of lime — four ounces to the gallon. (2) carbolic acid — 5 per cent solution. (3) caustic lime — one part hydrate of lime to eight parts water. (4) mercuric bichloride — 1:1000. The foregoing disinfectants are those which are most generally used, and those which are usually recommended by the highest authorities. They will usually be found effective. However, in case that these cannot be obtained, the following may be used: (1) For floors, cretosol — a teacupful to a gallon of warm water. This should be applied before sweeping. (2) For wooden handrails and desks, — a solution of chloride of lime — (teacupful to a gallon of water). Latrines should be flushed frequently, and disinfected with a solution of cretosol of the above strength. In case any article belonging to a child afflicted with an infectious disease cannot be disinfected, it should be burned without delay. F. B. D.

See Cleanliness of Schoolroom.

DISINFECTANTS FOR SCHOOL CHILDREN. — The need of personal disinfection in the schoolroom is much obviated by the free use of pure water, clean towels, and soap. Parents should be urged to send their children to school in a clean condition, as this greatly simplifies control of Church and State alike. It is plain that this fact gave the dissenters a new freedom, and, long before this, juries were refusing to convict dissenters charged with unlicensed teaching (see *Middlesex Sessions Rolls*, Vol. IV, p. 41, etc.). But dissenters did something other than gain their freedom through the courts. They showed by definite action how necessary they were to national education. In 1674 a definite and direct effort was made by the leading dissenters to obtain ameliorative legislation. Baxter (*q.v.*) and Tillotson drew up a Healing Bill, and though the bishops would not accept it, yet the legislation between dissent and Church made it impossible for the latter to insist on its full legal rights to suppress all teaching by dissenters. The joint action of the Church and dissent in 1674 in forming a trust to found schools and distribute religious literature in Wales also tended to make the position of the dissenters (many of whom had been ejected from their livings under the establishment on St. Bartholomew's Day, 1662) more possible.

The work done by the dissenters in endowing schools between 1674 and 1685 was very great, but their crowning work was the part that they played in starting the great charity school movement (*q.v.*). It seems almost certain that the Roman Catholic dissenters were the authors of the earliest stage of the charity school movement. King James II of course looked with favor on any Roman Catholic movement, but he could not assist one dissenting body in preference to another, and so the freedom to open schools that he gave to the Jesuits in and about London was also extended to the Presbyterian body. Three instances of Roman Catholic elementary schools in London are found about this time: "a crafty Jesuit, who in the year 1685 erected a free school in the suburbs of London" aroused the efforts of Dr. Tenison (then vicar of St. Martin's in the Fields), who erected a free school in Castle Street "for the education of divers poor boys of his parish, in opposition to that of the Jesuit" (Maitland's *London*). Here there is a direct instance of dissent stimulating the Establishment into new activity. Again, it is known that on May 3, 1686, James II (in pursuance of his prerogative power) issued a license to Edward Sclater of Putney to keep school and instruct youth (see Gotch's *Collectanea Curiosa*, Vol. I, pp. 290–293). The third instance of a Jesuit school is found in Wilkinson's *Londina Illustrata* (Vol. I, p. 137), in a full account of the famous Zoar Street Gravel Lane Charity School. While in central London the Jesuits stimulated the Church, in south London they stimulated the Presbyterian dissenters. By 1756 dissenting schools in London had considerably increased. The Presbyterians had schools at Bartholomew's Close, Fry's Court Tower Hall, Ratcliffe Highway, Shakespeare's Walk, Shadwell, and the Gravel Lane Southwark School. The Independents had schools in Keat's Street, Spittlefields, King's Head Court, Spittlefields, and Vincom Yard, Horsleydown. The one Quaker school was at Bridewell Walk, Clerkenwell. The dissenters attacked with a certain measure of success the poorest districts. Something like one twelfth of the charity school children in London were educated by the dissenters (and one tenth, if we only reckon boys) by the middle of the eighteenth century.

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The Education Act of 1870 created a new position, for it established side by side with the voluntary system a system of rate built and supported schools, which also received the government grant. The schools were severely handicapped in the struggle for existence, but that very fact stimulated Church efforts for education, and despite the fact that the introduction of compulsory education in 1876 was followed by free (elementary) education in 1891, these schools until 1902 managed to retain about half the children of the country. The schools provided out of the rates were and are undenominational in character, though Christianity of an undenominational type is taught in them, while the Church schools teach specifically Church doctrine. The nonconformists or dissenters have identified themselves with the movement for the universal extension of undenominational teaching in *all* public elementary schools during school hours, while Churchmen claim that the parochial church schools, which have for so long borne the burden of education in both rural and urban areas, should still continue to give (subject to the conscience clause which was common before and universal since 1870) Church teaching to the children of Church people, despite the fact that under the Education Act of 1902 all public elementary schools, whether voluntary or provided by a local authority, are maintained out of the rates combined with grants from the Board of Education. This dispute is still in progress, and there is much to be said for both sides. Dissenters complain that in country parishes, where there is only a Church school, the children of dissenters are liable to be infected by the clerical atmosphere, while Churchmen complain that in the undenominational schools the children of Church people are liable to be infected by the less definite religious atmosphere of such schools. The ancient dualism in education is in fact still operating, and, despite the many evils that arise from the bitterness of the conflict, there is still the ancient benefit of mutual stimulation. In the matter of education, however, the Established Church is no longer the controlling authority. But the point to be noted is that whatever the changes have been, there has always been a determination to retain in education a definite Christian character, and this determination has remained quite unaffected by the efforts made since 1850 to secure a system of purely secular education.

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These boards of school trustees, as is so frequently urged, undoubtedly represent the feelings and wishes of their districts. The argument that they are institutions which are close to the people is in most cases a strong one. This is, however, both their strength and their weakness. The schools must frequently take a position in advance of the people, and their ability to do so is often seriously impeded by unintelligent boards of district trustees. There is little business in a rural district which could not be transacted as well by one man as by three, and the difficulty of finding three good men to manage a school, for every teacher employed, is indeed great. In Illinois, for example, about 33,000 school trustees are required to conduct the school business of the rural and ungraded schools of the state, which employ about 12,000 teachers, with a cost for maintenance of about $500,000 each year; while in the City of Chicago twenty-one men look after the school affairs of a school system employing over 6000 teachers, and costing, for maintenance only, over $8,000,000 a year. The system of district management is ultra-conservative and educationally inefficient; the trustees frequently assume authority over matters of which they are relatively ignorant; and almost all progress in school administration and efficiency, in so far as it relates to rural schools, has been made without the support and often against the opposition of the district school authorities. Various means have been adopted to improve the situation from within by improving the rural school trustee, but without success. A trustee day at the county institute has been set apart, in many places, but the attendance in most cases has been small. Perhaps the most significant movement, if existing boards of trustees are to be retained, has been that of Pennsylvania and certain states in the Northwest (North Dakota, South Dakota, Minnesota, Wisconsin), where annual conventions of trustees must be called by the county superintendent for the discussion of matters relating to the welfare of the schools. Attendance of trustees is compulsory, and mileage and a *per diem* is paid for attendance.

E. P. C.

See articles on the different state school systems, as Alabama, Arkansas, California, etc., for further and more detailed information as to the number, method of election, and powers and duties of district boards of trustees; see also, District System for the historical account.

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DISTRICT MEETING. — A meeting of the resident legal voters of the school district, called to elect officers and to transact business, or to decide matters of local importance. In a number of states women have been declared legal voters at school meetings. The annual district meeting is a regular feature of a number of states, where it has done good service in the past in the education of the people in the forms of self-government. The authority of the district meeting is to-day greatly restricted, and in the newer states it has little power, except in matters relating to building, moving the schoolhouse, or directing the course of district litigation. Even in these matters, it can only direct the trustees of the district how to act. In the older states its powers are greater. Everywhere, however, its powers have been decreased from what they originally were, and the functions it once exercised have been transferred to its officers or to township, town, or county school officials, or to the state. The annual district meeting is in but a few states still competent to decide who shall be employed to teach the school, this being now in the hands of the district officers, or, under the county system, in the hands of the county board of education; while the selection of textbooks and the prescribing of what shall be taught is now generally decided by the state.

Much has been said both for and against the district school meeting. Under primitive conditions, when the belief in the public schools was weak, the meeting did its greatest service. It was suited, too, to rural conditions. On the other hand, it was inefficient, inconsistent, and unprogressive as a means of administration, and many fierce animosities were engendered over matters too trifling to merit a meeting for consideration, and the efficiency and usefulness of the schools were seriously impaired by those factional disturbances. The decline of the school meeting as an institution set in years ago, the states finding it necessary to deprive district meetings of their authority and to impose requirements as to taxation, term, teachers, and instruction in order to secure reasonably satisfactory conditions and progress. Efficient school administration has been promoted in proportion as the importance of the district meeting has been minimized. E. P. C.

See also articles on District Boards of Trustees, and references cited there, and on Centralization.

DISTRICT OF COLUMBIA. — The Federal district on the Potomac River, in which the capital of the United States has been located since 1800. The total population of the district in 1910 was 331,069. Of its population in 1900 31.1 per cent were of the negro race, and 10.2 per cent were foreign born. Germans, Irish, and English together comprised 75 per cent of the foreign born. The percentage of illiterates in the population of 1900 was 1.6 per cent for the white people, and 24.3 per cent for the negroes. The population includes many officials who are only temporary residents of Washington, and who have little interest in a good educational system for the district. City charters were granted by Congress to Washington, Georgetown, and Alexandria, the affairs of the district being under the immediate control of Congress. In 1862 the affairs of the district were placed under the control of the Secretary of the Interior. In 1873 the district was organized as a territory, but the next year the territorial form of government was abolished, and the immediate control of the district was given to a board of three Commissioners, appointed by the President, with the concurrence of the Senate. This form of government has since continued, and the Board of Education for the district reports annually to these Commissioners.

Educational History. — The schools of Washington owe their origin to " An Act to establish and endow a permanent institution for the education of youth in the city of Washington," enacted by the City Council, on Dec. 15, 1804. This created a board of thirteen school trustees, seven of whom were to be appointed by the council, and six to be chosen from among those who had contributed to their support, one vote being given for each ten dollars contributed. Thomas Jefferson, having contributed $200, was elected one of the six, and also the first President of the new Board of Trustees. An elaborate plan for a system of public instruction was drawn up, to extend from the common schools to and through a college and a university. At first only elementary instruction was to be provided. Two schools were opened near the close of the year 1805, but in 1809 these two schools were merged into one. In 1816 two boards of trustees were created to manage the two schools then in existence, after the district plan, one of seven for the Eastern School, and one of seven for the Western School. In 1811 a Lancasterian (see LANCASTER, JOSEPH) school was opened in Georgetown, under the control of the trustees of the Georgetown Free School, and continued under this management until 1842, when this board was supplanted by a Board of Guardians, appointed to manage the schools of the city. The first school in the District to which girls were admitted was established in Georgetown in 1812, and a year or two later a similar school was opened in Washington.

From 1805 to 1844 has been termed the charity, or pauper school, period of the schools of Washington. The act of 1804 gave the trustees a maximum of $1500 annually from the proceeds of the tax on slaves, dogs, and various forms of licenses, which, with tuition fees and contributions, made up the available revenue. Between 1812 and 1838 Congress, in response to numerous appeals for aid, passed fourteen joint resolutions authorizing lotteries for the benefit of a fund for schools. Tuition charges were at first levied on all who could pay, and those who paid were given advanced instruction not open to indigent and charity pupils. In 1820 the schools were declared to be exclusively of the charity type, and no pay pupils were to be received. In 1831 only the children of parents having an income of less than $1.50 per day, or the children of parents having more than four children, were to be admitted to the schools. In 1840 only 1200 of the city's 5000 white children were in attendance at any school, and these were provided with the poorest of buildings, books, and teachers. Only a few private schools existed for the negro children of the city. The pauper school idea took deep root in the District, and it was not until some time after the Civil War that any proper conception of the importance of free public education came to be generally held.

The period from 1865 to 1890 was a period of organization and reorganization, during which partial harmony and unity were secured, and the school system was rounded out. In 1864 the first modern school building (a ten-room building) was begun; in 1868 instruction in drawing was introduced; in 1869 a Superintendent of Schools was appointed; in 1870 a preparatory high school for colored students was organized; in 1873 a normal school for white students was established; in 1876 the first high school for girls, and in 1877 the first high school for boys, were organized; in 1879 the normal school for colored students, organized in 1876, was incorporated into the school system of the District; in 1880 the two high schools were merged to form the Central High School for boys and girls, and in 1882 the high school course was extended from two to three years; in 1880 supervising principalships were created; in 1886 entrance examinations to the high schools were abolished; in 1890 two branch high schools were organized; in 1891 the colored high school was definitely established and became known as the M Street School; in 1892 the high school course was extended to four years; in 1896 a Director of High Schools was appointed; in 1901 the business courses, organized in 1889, were separated, and a business high school organized, and the McKinley Manual Training High School was opened; in 1902 the Armstrong Manual Training High School for colored students was opened; and in 1903 medical inspection was provided by the District Commissioners.

The management of the schools has also changed during this time. The consolidation of the two boards of trustees of Washington in 1844 was the first step toward an unification which is as yet incomplete. This board and the board for colored schools increased in size by the increase in wards, until they numbered forty-one by 1873, when they were reduced by law to nineteen, the board for white schools being reduced from twenty to eight, and that for colored schools from twenty-one to eleven.

The next year the four boards of trustees of the District, viz., the board for white and the board for colored schools in Washington, the Georgetown board, and the board of trustees for country schools were all abolished, and all of the schools of the district, white and colored, were consolidated under one management in the form of a Board of Trustees for the Schools of the District of Columbia, composed of nineteen members, eleven elected from the city of Washington, three from Georgetown, and five from the country districts. In 1882 this board was further reduced to nine. In 1895 two women were added, making the number eleven. In 1900 this Board of Trustees was abolished, and a new Board of Education of seven members was created, to be appointed by the Commissioners of the District of Columbia, for, after the first arrangement, seven-year terms. A partial unification of white and colored schools was also secured by subordinating the superintendent of colored schools to the superintendent of white schools. In 1906, after a prolonged hearing, following a stormy period of six years, another new Board of Education was created, to consist of nine members, three of whom shall be women, and three of whom shall be of the colored race. They are to be appointed by the Justices of the Supreme Court, for three-year terms, after the first apportionment of terms to insure one third retiring each year.

Present School System. — This Board of Education of nine members, created by the act of 1906, has a nominal control of the schools of the District. They report to the Commissioners of the District of Columbia, who are the Council, the Mayor, and the Board of Apportionment and Revenue all in one, but secure their appropriations from Congress, which is the real Board of Education for the District. All salaries and all important expenditures must be fixed by Congressional legislation. The new Board of Education is to determine all questions of general educational policy, and to appoint its executive officers. The Superintendent of Schools is appointed for a three-year term, and has control of the educational work of the District. He recommends, since 1906 for the first time, all teachers, principals, and supervisors, for appointment, promotion, and dismissal by the board. He is assisted by one Assistant Superintendent for white schools; one Assistant Superintendent for colored schools; one Director of Intermediate Instruction in white schools; a Supervisor of Manual Training; directors of drawing, physical culture, music, domestic science, domestic art, primary instruction, kindergartens, and night schools; and thirteen supervising principals.

The schools of the District are grouped into thirteen divisions, nine of which include the white schools and four the colored schools. Each group consists of from eight to twelve school buildings, and is in charge of a supervising principal. The school system for whites consists of a normal school, five high schools, and eighty-seven elementary schools. The school system for colored pupils consists of a normal school, two high schools, and forty-four elementary schools. The school system employed, in 1908–1909, forty-three supervisory officers, 1583 teachers in day schools, and 95 teachers in evening schools; 113 of the day school teachers were employed in kindergartens and 235 in the high schools. In addition to these there is a Special school for Backward and Atypical Children for each race; the Kendall School for deaf and dumb of the white race, and the Colored Institute for the same class of the other race; and two industrial reform schools, one for boys and the other for girls.

The business affairs of the board are handled by the Commissioners of the District of Columbia, who control schoolhouse plans, repairs, purchases of every kind, salary adjustments, and, in some respects, even rules and regulations. The term "Board of Education" is a misnomer, for the board is without power, and is little more than a board of school visitors. Courts and Commissioners may review its decisions; treasury officials revise its estimates; and the board has no authority to make a single purchase. The board has no treasurer, auditor, business manager, architect, funds, or property. Its one non-educational officer is a secretary, who is also a member of the District Supply Commission, and acts as intermediary between the board and the Commissioners. Requests for funds are made by the Board of Education to the Commissioners of the District of Columbia, who pass on them and embody such requests as they approve in their estimate of funds needed to conduct the affairs of the District. One half of the expenses of the District come from a district tax, the other half from Congressional appropriations. This estimate is then submitted to Congress, and referred to the proper committees of the two houses; and Congress grants what it sees fit. Progress under this plan is relatively slow, and the facility with which Congress can reconstruct the school system, as a part of the annual appropriation bill, makes interference easy and a continuous policy almost an impossibility. The salaries for teachers and supervisors, as established by Congress, are relatively small, — those for the more important positions very small, — and the appropriations for new buildings are inadequate to provide for the growth of the city. The recent report of the School House Commission, created by the act of 1906, revealed many poor and antiquated buildings, and a very inadequate material equipment.

The confusion existing is hardly credible. Authority and responsibility are hopelessly tied up with red tape. The bureau methods in use are entirely inadequate to the task. An attempt is made to manage a large city school system by small town methods, and the result is disastrous. Educational conditions in Washington, from an administrative point of view, are among the worst to be found in any city in the Union, and the school system is behind that of cities elsewhere of equal size. The corps of superintendents is entirely inadequate, and there is no power to administer remedies or to standardize instruction and equipment. Until Congress can be made to realize that it is incompetent properly to administer such an undertaking, and will give to the Board of Education the power and control which should belong to it, there is little hope of a good, modern school system for the District of Columbia. The superintendency of the schools of Washington is generally regarded as one of the most difficult and most undesirable positions in the United States.

The total cost for maintenance alone in 1908–1909 was $1,711,422. About two thirds of the total receipts for all educational purposes came from Congressional appropriations, the other third from district taxation. The schools of the District have no income from permanent funds. The Washington School Fund, which was derived from the lotteries authorized by Congress between 1812 and 1838, and which in 1881 amounted to $70,630.47, was appropriated by Congress, at that time, to build the Washington (now Central) High School building. This was finally consented to in order to overcome the objections of certain members of Congress to spending public money for secondary education. The total expenditure for schools in 1908–1909 was equal to 29 cents per pupil in average daily attendance per day, and $51.24 per year. In amount (72 cents) which each adult male must contribute to provide $1. Washington ranks with the New England states, or the more wealthy states of the West, and this small amount produced the large sum of $35.21 for each child, from five to eighteen years of age. The percentage of the school population, from five to eighteen years enrolled (77.51 per cent), and the percentage of the school enrollment in average daily attendance (80.72 per cent) are both high, though the District had no compulsory education law until 1906. A nine months' school term is provided.

Higher Education. — The nation maintains two institutions of collegiate rank in the District of Columbia, — Gallaudet College, for the deaf and dumb, established in 1864; and Howard University (*q.v.*), a college for the negro race, established in 1867. Besides these national schools, the following institutions of higher learning exist in the district: —

Institution	Year of Opening	Control	For
Georgetown University . . .	1789	R. C.	Men
George Washington University	1821	Nonsectarian	Both sexes
St. John's College	1870	R. C.	Men
Catholic University of America	1889	R. C.	Men
Trinity College	1900	R. C.	Women

In addition other institutions, national in their scope of influence and educational in their nature, are located in the national capital. Most important of these are the Carnegie Institution for the Advancement of Learning (*q.v.*) and the Smithsonian Institution. Similarly the various bureaus of the National Government, such as the Geological Survey, Bureau of Ethnology, various bureaus of the Department of Agriculture, and the Library of Congress (*q.v.*), have become educational institutions of great importance. These are discussed under the caption NATIONAL GOVERNMENT AND EDUCATION.

Many efforts have been made during the past forty years to establish in Washington a great national university but so far no bill looking to that end has succeeded in securing the approval of Congress. (See NATIONAL UNIVERSITY.)

E. P. C.

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DISTRICT SCHOOL. — A term applied to the elementary or common school maintained in the rural school districts of the state. To-day more generally spoken of as the rural school.

See DISTRICT BOARDS OF TRUSTEES; DISTRICT MEETING; DISTRICT SYSTEM.

DISTRICT SCHOOL INSPECTOR. — A new official, now in the process of evolution, and of rather uncertain future. The appointment of such an officer has come from a feeling of need of some form of supervision for rural schools, and particularly of graded schools which receive state grants for compliance with certain improved conditions. In Minnesota the official is known as a State Inspector of Graded Schools; in Illinois he is known as Rural School Inspector. In Minnesota it is the duty of this officer to inspect all graded elementary schools to see if they comply with the conditions of the law for state aid, while in Illinois the official is a deputy from the office of the state Superintendent of Public Instruction, who inspects and approves schools which meet certain conditions as to building, equipment, and teacher, and designates them as standard rural schools. The state agents employed for so long by Massachusetts and Connecticut were in a certain sense state inspectors of rural schools. A few other states have appointed such an officer, but his work and position are as yet uncertain. If a satisfactory system of county school supervision could be provided, there would be relatively small need of such a state official, and the present weakness of county supervision is the actuating cause of the appointment of these inspectors.

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DISTRICT SCHOOL JOURNAL. — See Journalism, Educational.

DISTRICT SYSTEM. — By this is meant a form of educational organization under which the school district is the unit of organization, conducting its affairs without much oversight or control from any higher authority, except such oversight as is given by the county superintendent of schools, or the county board of education, if such a body exists, acting under the general school laws of the state. Under the district system local organization and control is at a maximum, and central control are at a minimum. The district-system forms of organization which prevail in Arkansas and Illinois are good examples of the district system of control. The town system, as seen in Massachusetts; the township system, as seen in Indiana; the division system, as seen in Kentucky; and the county system, as seen in Florida and Louisiana, are examples of a progressively more centralized system of school organization, with a view to securing greater educational efficiency.

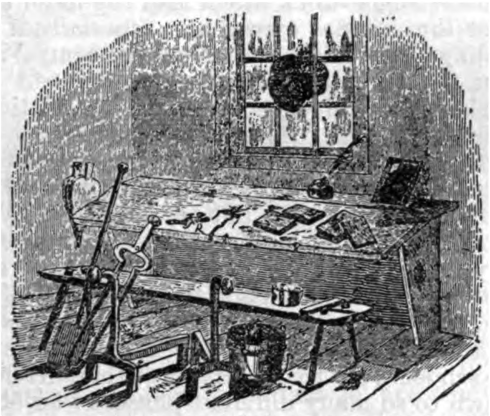
(See separate articles on these different systems, under the proper headings. Also see the articles on District Boards of Trustees, and on District Meeting.)

The rise of the district system, historically, is of much interest. In the original New England colonies the town was the unit of both church and civil government. In Massachusetts by 1700 as many as twenty separate parishes had been created within the eighty towns then existing, and the number increased rapidly during the next half century. Each parish possessed full civil machinery for carrying out the religious purpose, — the parish meeting, clerk, constable, and assessors, — and the parish meeting soon became a center for the discussion of parish interests other than those of the church, and for the rise of democracy and for the assertion of parish or district rights. This greatly accelerated the movement toward decentralization. The democratic desire for local control and for maximum benefits from all taxes paid led to still other demands. The division of the town into districts for the repair of highways, with surveyors for each, soon came about, and after 1725 definite surveyors' districts existed generally in the towns. Such districts gradually became smaller in area, as well as more clearly defined. Some towns also were divided into districts for recruiting the militia, and constables and assessors were elected for different parts of the town. All of these influences tended toward the growth of district consciousness as opposed to town consciousness, and to the development of the civil and democratic consciousness as opposed to the earlier religious government of the town.

The rise of the dame school (*q.v.*) in these parishes in the summer, and the presence of the private school taught by a master in the winter, provided a more convenient means of instruction than the central town school afforded. As the town schools in nearly all cases were supported in part by the rate-bill or tuition fees, this local support of dame and private schools tended materially to reduce the available funds for the maintenance of the town school. As the laws of the colonies required the maintenance of schools, and the central authorities were insistent that the provisions of the laws should be carried out, and as the fines for failure to comply were almost sufficient to pay a master, it became necessary for the towns to decrease, and finally entirely to abolish the tuition charge, and to maintain the town school wholly by a general tax levied on the property of the whole town. This was the opportunity of the parishes, or districts, and the price of the consent of the outer parishes to the town tax rate was the division of the town school. (See Divided School.) The practical wisdom of these democratic parish meetings now asserted itself, and the moving town school, by which the town school was carried to all of the parts of the town, in rotation, or the establishment of additional town schools, or both, was the result. The date for the attainment of this stage in the evolution of the district school may be placed as in the first quarter of the eighteenth century, and from this time until the latter half of the eighteenth century, when the district organization was authorized generally by law and given full legal standing, the evolution of the district school out of the moving school was going on. The evolution took different lines in different towns, but the final result was much the same in all.

In some towns the location of the school was changed from year to year, schoolhouses to accommodate it were built from time to time, and school centers or districts were thus gradually established. In other towns the school moved about each year, being held in each center at first an arbitrary number of weeks, and later a number of weeks proportional to the amount of school tax paid by the center, this latter leading to the final apportionment to each district by the town of the money paid in school taxes by each center or district. Schoolhouses were also built in the districts from time to time, as in the case above, and the district school organization thus became fixed. Thus the parish, section, or road district gradually evolved into the school district as well, and district school officials, to take charge of the new district schools, were added to the other parish officers.

The evolution is traced in the articles on the several states, especially those on Connecticut and Massachusetts. The Massachusetts laws of 1642 and 1647, relating to the maintenance of schools by the towns, applied, but in 1805 the towns were empowered to subdivide into school districts; in 1827 district committees of one for each district were directed to be appointed by the towns; in 1829 the power to appoint was delegated to the districts, the district committees might consist of three residents, and these committees were given power to select teachers, provide board and fuel, and supervise the schools. Maine did not separate from Massachusetts until 1820, but the first school law of the new state definitely adopted the Massachusetts district system. In Rhode Island the district organization was begun shortly after it was in Connecticut. The districts were known as " squadrons," and the district authorities were given entire control of their schools, schoolhouses, and school lands, the employment of teachers, and the management of the schools. In Vermont the first school law in 1782 empowered the towns to form districts and to elect trustees, who were to hold property, establish schools, and build schoolhouses. The towns were permitted to alter the boundaries of districts and to create new ones, but otherwise the districts were practically independent of the towns. The first New York school law of 1795 provided for town organization, with the supervision and direction of the schools placed under three to seven town school commissioners, elected by the people of the towns, and with two or more district trustees, elected by the people of the districts, who should confer and advise with the town school commissioners. This law expired by limitation in 1800, and on the revival of the school system in 1812 the district organization, with three trustees for each, was definitely established, and to these trustees was confided the care and the supervision of the schools of the district. By 1827 the district system had superseded the town system throughout New England, and was generally in use elsewhere.



Apparatus and equipment of the district school as it was.

New England settlers moving to what was then the West carried the district system with them. Though Congress, in the Ordinance of 1787, had paved the way for the township system, and though the earliest school laws in Indiana and Michigan provided for a township form of organization, the district system was soon adopted as better suited to the conditions and needs of the time. Ohio definitely adopted the district system in 1821, Illinois in 1825, Indiana in 1833, and Michigan in 1837, and the system gradually extended into the West and South, and is to-day common in the North Central and Western divisions. It was suited to the earlier conditions, when population was sparse, intercourse limited, communication difficult, and isolation the rule, and also to the earlier conception of the nature and purpose of education. Under modern conditions it is unsatisfactory, wasteful, and unintelligent in action, and in a number of states it has been modified in the interests of better educational administration. (See articles on CONSOLIDATION OF SCHOOLS; COUNTY SYSTEM; DIVISION SYSTEM; TOWN SYSTEM; TOWNSHIP SYSTEM.)

The struggle to control and to subordinate the district system has been a long and a bitter one. To some it has seemed that its curtailment or abolition meant the curtailment or abolition of all local liberty. Much patriotic eloquence has been poured forth in defense of the system, and natural centralizing tendencies have been pictured as striking at the very foundations of American life. As a system of school administration, though, the district system has gradually outlived its usefulness in all except remote regions, and almost everywhere its powers have been curtailed or modified by the creation of new supervisory agencies, and not infrequently it has been abolished, in whole or in large part, by the creation of the town, township, division, or county systems. The struggle began in 1853 in Massachusetts, but the old town system was not finally restored until 1882. In 1853 town school committees were empowered to abolish the districts, but in 1857 this law was repealed. In 1859 the district system was abolished throughout the state, but in the autumn of that year a special session of the legislature repealed the law. In 1869 the district system was again abolished, but in 1870 any town, by a two thirds vote, was permitted to return to the system. In 1882 the system was finally abolished throughout the state, after all the larger towns had voluntarily abandoned it, and since 1882 the town system of school management has everywhere prevailed. Connecticut began the process in 1865, but it was not completed until 1909, many of the smaller and poorer towns still clinging to the district system, though its abolition was frequently recommended and attempted. In Rhode Island, where permission to abolish the district system was granted to the towns at a somewhat late date, the process was completed in 1893. Maine abolished the district system in 1893. New Hampshire granted the towns permission to return to the town system in 1870, and in 1885 entirely abolished the district system. Vermont granted similar permission in 1870; in 1884, required all towns to vote on the question; and, in 1892, abolished the district system except in the case of specially incorporated town districts. In Indiana the new school law of 1852, following the new constitution of 1851, provided for the township system and reduced the school districts to subdistricts with little power. The county system of the South has long been in use, and the division system of Kentucky has only recently been worked out; but both have for their purpose the reduction of the power and the importance of the school districts. The rise of the county superintendency in the Central, Western, and Southern states, with frequently the adoption of a modified form of the county system of government, with the consequent transference of functions from the districts to the county superintendents and to county boards of education, has also done much to weaken the district system and to deprive district authorities of many of their former powers. E. P. C.

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DITTES, FRIEDRICH (1829–1896). — Born at Irfersgrün, Saxony, he received his training at the teachers' seminary in Plauen; later on prepared himself for the University of Leipzig, where he studied philosophy, mathematics, and natural science, and received the doctor's degree in 1860. In the meantime he had been engaged as teacher in various schools, and now became the subrector of the realschule in Chemnitz. Here, at a teachers' convention in 1864, he delivered an address which caused a reorganization of the Saxony elementary and normal schools. The next year he was appointed director of the seminary at Gotha and inspector of the schools of the duchy. A new period in Dittes's life began when he was called, in 1868, as director to the Vienna *Pædagogium*, a newly established institution of a unique character, not a training school, but a school of pedagogy, intended for the higher education of teachers already in office. In this position, which he filled until his retirement in 1881, he exerted great influence on the development of the Austrian elementary schools, and fought vigorously for the emancipation of the school from the Church. In 1874 he was elected to the Austrian parliament, where he brilliantly defended the liberal Austrian school law of 1869 against the attacks of the clerical party. After his retirement he devoted himself to editing his educational review, *Pædagogium*, which he had established in 1878. Many of his writings were in opposition to the theories of Herbart and Ziller, his own pedagogical theory being based on the psychology of Beneke (*q.v.*). His chief works are *Grundriss der Erziehungs- und Unterrichtslehre* (*Outline of the Theory of Education and Instruction*), 1868; *Geschichte der Erziehung* (*History of Education*), 1870; and *Schule der Pädagogik*, 1875. F. M.

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DIVERGENT ASSOCIATION. — Whenever an experience is made the center of a whole series of suggestions which lead the mind away from the original experience, especially if this leading of the mind away from the central issue does not contribute to the development of a single system of experience, the association is called divergent. Thus if the appearance of a person suggests to the mind of an observer a large number of other persons who are in no wise related to each other, but are suggested by the person now under observation, the impression may be regarded as a center of divergent association. Divergent association is a type of distraction which may have the appearance of organized mental activity. Thus children in the schools very frequently have their attention drawn to so many different phases of an object that instead of building up a coherent system of ideas they are distracted through the divergent associations suggested to them.

See Association; Attention.

DIVIDED SCHOOL. — That form of the New England town school, which, in the evolution of local school administration, came between the moving school (*q.v.*) and the district school (*q.v.*). It was a school which existed in two or more parts with two or more teachers, each teaching in different sections of the town, and with each pupil attending school in only one place. Yet the sense of unity was so strong that it was managed through the town meeting or the school committee in the interests of the town as a whole, and was regarded as one school. The same conditions which produced the moving school operated to bring about the divided school (the former never having existed in some towns), but with these in addition: (1) desire for longer terms of school for each section than could be secured through the moving school; (2) willingness to pay increased town rates to obtain this benefit; and (3), in some cases, isolation of certain sections or a widely scattered population, which prevented children from attending school in more than one section. The divided school existed generally throughout New England during the last three quarters of the eighteenth century, and in many different forms. During that time it passed through a process of evolution caused by the development, in a population growing more dense, of the tendencies which produced it. This evolution consisted of four submovements: (1) toward definite bounds between the sections; (2) toward one teacher for each section; (3) toward the right of each section to the benefits of all the money paid by its inhabitants for the support of the school; (4) toward definite and direct control by each section of the school through its representative upon the school committee. When these four submovements were completed in any town, the school district virtually existed in its crude form, and the divided school was at an end.

H. U.

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DIVINITY SCHOOL OF THE PROTESTANT EPISCOPAL CHURCH, PHILADELPHIA, PA. — An institution founded in 1862 for the training of candidates for the ministry. Any person who has been admitted a candidate for Holy Orders, is admitted to the school, provided also he has the necessary collegiate training or its equivalent. A course of three years is provided. Graduates of the school or other theological seminary, holding the degree in arts of a university or college, are admitted to the graduate courses which lead to the degrees of Bachelor of Divinity and Doctor of Divinity. There is a faculty of seven professors and instructors.

DIVISION. — The fourth of the four fundamental operations, as now usually considered. Various names have been given to the operation, but "partition" and "division" have been the favorites. The former was common in the early Italian books, and those which appeared under the Italian and Spanish influence. Thus we find it in the Treviso arithmetic (1478), and in the works of Ortega (1512), Ghaligai (1521), Savonne (1563), and Santa Cruz (1594). The Dutch-French work of Wentsel has *Deuisio: dat is deelinge, Diuisio: e' esta dire, partir.* Thus "partition" was used by the vernacular writers as exactly synonymous with "division." The Latin writers often preferred the other term, as is seen in the works of Huswirt (1501), Scheubel (1545), Stifel (1544), and Ramus (1555). Many of the more scholarly writers used both terms, as is shown by the works of Paciuolo (1494), Tartaglia (1556), Clavius (1585), and Baker (1568). The use of the term "partition" to indicate only the division of a concrete by an abstract number, as distinct from "measuring," which is the division of one concrete number by another, is not warranted by any extensive history.

The definition of the operation has given much trouble. Early writers generally defined it as the operation of finding how many times the divisor is contained in the dividend, as in Hylles (1600): —

> "Diuision doth search how oft the diuisor
> In Diuidend may be quoted or found
> Whereof the quotient is the decidor."

This definition is open to the objection that $7 \div 3 = 2\frac{1}{3}$, and that "$2\frac{1}{3}$ times" is meaningless according to the primitive use of the word "times." It also fails to provide for the case of $\$10 \div 2 = \$5$, where the quotient is hardly to be called "times." A second definition that has met with some favor states that division is the finding of a third number that is contained as many times in the dividend as unity is contained in the divisor. This appears in the Treviso arithmetic of 1478, and goes back at least to Maximus Planudes (*c.* 1330); but it is open to the second objection already mentioned. A third definition speaks of division as the finding of a number that has to 1 the same ratio that the dividend has to the divisor. This is used by writers like Huswirt (1501), Cataneo (1546), Scheubel (1545), Stifel (1544), and Peletier (1549). The most usable definition describes division as the process by which, given the product of two numbers and one of them, the other is found. This allows for forms like the following: $\$10 \div \$5 = 2$, $\$10 \div 2 = \$5$, $\frac{2}{3} \div \frac{3}{4} = \frac{8}{9}$, and so on. Strangely enough, this seems to be the oldest definition of all, and to have been used in ancient Egypt. The terms used in division are merely abbreviated translations of Latin expressions. *Numerus dividendus* means simply "number to be divided," and this has been shortened to "dividend." In the same way *Numerus divisor*, "the dividing number," has been abbreviated to "divisor." The result of a division was formerly called merely the answer, the issue, the result, or some similar name. Thus we have in the commentary on Boethius by Clichtoveus (1510) *Tertius est numerus ex divisione proueniens*, and *hic est querendus*, or the *quotiens.* The Latin writers often spoke of the result as the "how many?" From this comes our word "quotient." The twofold nature of division is represented by these cases: $\$10 \div 2 = \$5$, and $\$10 \div \$5 = 2$. These were noticed as early as 1526 by Rudolff, and very likely still earlier.

The operation of division is the most difficult of the four common ones, and has always been so considered. There have been many devices and arrangements of the figures, and of these a few will be given. The Egyptian of the time of Ahmes (*q.v.*), say 3600 years ago, would have divided 19 by 8 as here shown, only he would have used different figures. (See NOTATION.) He would have stated the result as $2+\frac{1}{4}+\frac{1}{8}$, while we should give it as $2\frac{3}{8}$. The most common of the early forms was division *per colona, i.e.* by the use of the products stated in the columns of the extensive multiplication tables used by the merchants, or by the help of memorized products. Tartaglia (1556) speaks of this as "per colona, ouer di testa, ouer per discorso, ouer per toletta . . . aregolo, ouer alla dritta, ouer tauoletta." The Treviso (1478) arithmetic arranges the work of 7624 ÷ 2 as follows:

1	8
2	16
$\frac{1}{2}$	4
$\frac{1}{4}$	2
$\frac{1}{8}$	1

Lo partitore 2. 7624 | 0 lauanzo
La parte 3812 |

I.e. 7624 ÷ 2 = 3812, and 0 remainder.

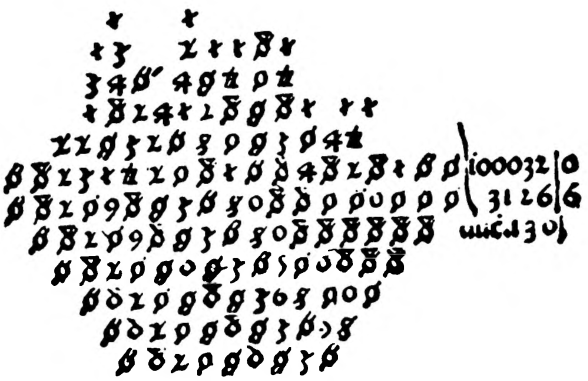
A complementary plan was used by Gerbert (*c.* 1000), as follows: $900 \div 8 = 900 \div (10-2) =$

$$10-2)\ 900\ (\ 90+18+3+1+\tfrac{1}{2}=112\tfrac{1}{2}$$
$$\underline{900-180}$$
$$180$$
$$\underline{180-36}$$
$$36$$
$$\underline{30-6}$$
$$6+6=12$$
$$\underline{10-2}$$
$$2+2=4,\ \tfrac{4}{8}=\tfrac{1}{2}$$

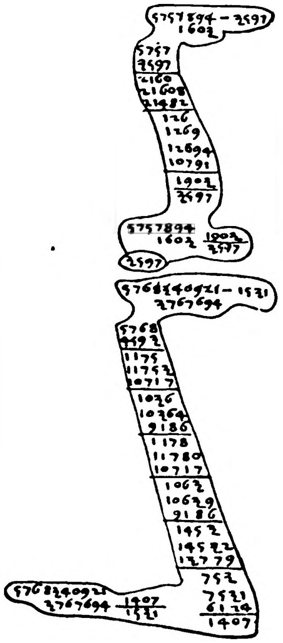
The arrangement of this work was not as given above, but as is here shown: —

c	x	1
		2
		8
9		
1	8	
	2	
1		
	2	
		4
	1	
	1	
	9	2
1	1	2

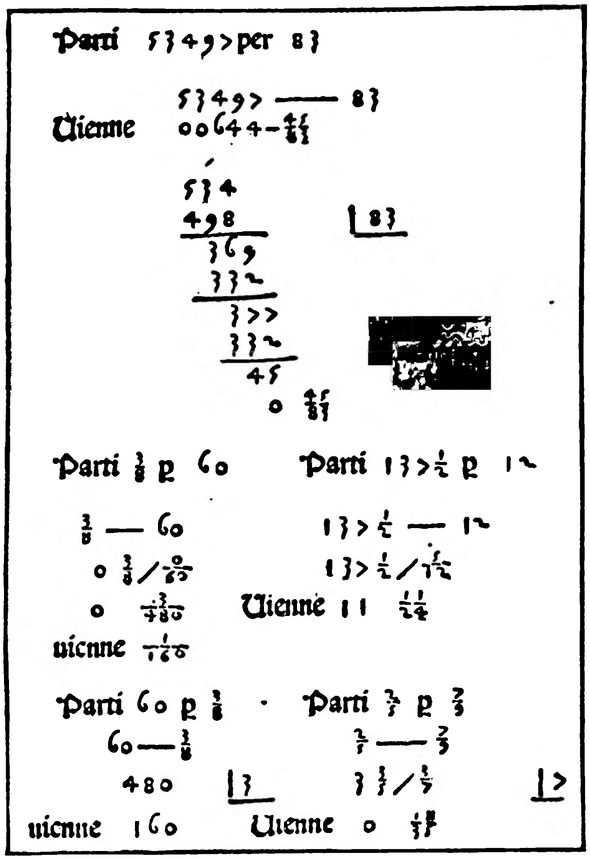
Another method, common in the later Middle Ages, was the division by factors, *per repiego*, as the Italians called it. Thus, to divide 216 by 24, first divide by 8 and then divide by 3. The most common of the early methods is that known as the galley, batello, or scratch method. It is probably of Hindu origin, and its history can be fairly well traced from the early stages. The name comes from the fact that the array of figures resembles a galley or boat (*batello*). In England it was sometimes called the scratch method, because the figures were scratched out. It is illustrated by the following from the first printed arithmetic (Treviso, 1478): —



Upon this method Maximus Planudes (*c.* 1330) throws some light. It is, he says, "very difficult to perform on paper, with ink, but it naturally lends itself to the sand abacus." (See ABACUS.) "The necessity for erasing certain numbers, and writing others in their places, gives rise to much confusion where ink is used; but on the sand table it is easy to erase numbers with the fingers and to write others in their places."



Our present method of long division is a matter of slow growth. Traces are found in Persia in the fourteenth century, and about the same time Maximus Planudes gives what he calls an Arab method, which is analogous to ours. It appears in Italian manuscripts of the fifteenth century in the form here shown, this being a facsimile of a Florentine solution of about 1450. It first appeared in print in Calandri's arithmetic, which was printed at Florence in 1491, in the form shown in the following illustration. It was not until the eighteenth century that this form entirely replaced the old galley method.



At present two methods are recognized, the modern names being "short division" and "long division." In the latter the quotient is coming to be written over the dividend because of the ease of determining where to place the decimal point. In short division it is the custom to place the quotient below on account of ease in writing and in performing several successive divisions. Some writers place it above, because this is done in long division, but the argument is not a cogent one, and the effort to change the custom of the world is not likely to succeed for such a trivial reason.

$$\begin{array}{r} .11 \\ 22\overline{)2.42} \\ \underline{2\,2} \\ 22 \\ \underline{22} \end{array}$$

$$2\underline{)246} \qquad \begin{array}{r} 123 \\ 2\overline{)246} \end{array}$$
$$\;\;123$$

D. E. S.

DIVISION SYSTEM. — A system of school organization as exemplified in Kentucky (*q.v.*), which the school districts of each county are grouped into a number of divisions (in Kentucky, four, six, or eight), and the schools of each division are controlled by a division board. In the evolution of a centralized system, the Kentucky plan is a halfway stage between the district system of Arkansas or Kansas and the county system of Louisiana or Florida. A similar form of organization is to be found in Tennessee. E. P. C.

DIZZINESS. — A form of sensation which arises through the excessive stimulation of the semicircular canals. The semicircular canals are a part of the ear, in no way connected with the function of hearing, but constituting rather the organ of equilibration. When this organ is excessively stimulated, either through pathological conditions within the organ or through a violent movement of the body as a whole, a peculiar and intense form of sensation arises which is described by the term "dizziness."

DOANE COLLEGE, CRETE, NEB. — A coeducational institution, which was the outgrowth of the Crete Academy, a preparatory school organized in 1871. Doane College, the center of Congregational education in Nebraska, has four other academies in the state from which it draws students. The government is vested in a self-perpetuating Board of Trustees, who serve three years, but are eligible for reëlection; three quarters of the twenty-seven members of this board must be members of Congregational churches. Besides the usual undergraduate courses and the academy, departments are maintained in music, elocution, and art. There are no college fraternities. Grounds, buildings, and equipment were valued (1906) at $127,640; the total annual income is $28,013. The average salary of a professor is $990. The instructing staff numbers (1909) twenty-seven, including the teachers in the academy; of this number seven are full professors. There was in 1910–1911 an enrollment of 247 students in all departments. C. G.

DOCENT. — Literally a teacher or instructor (Latin *docere*). In this country the term is employed in Chicago and Clark Universities with special meaning. At Chicago it refers to a position higher than that of fellow, while at Clark the position of docent is the highest annual appointment, an "honor reserved for men whose work has already marked a distinct advance beyond the doctorate, and who wish to engage in research." The time of the docents is mainly devoted to study and research, although they are also expected to do some teaching. Those found worthy may be given the *licentia docendi*, in which case the position may be said to correspond to a "brevet collegiate professorship."

In Germany the term is synonymous with *Privatdocent*, or university instructor below the rank of professor. To become a private docent, a candidate must have obtained the doctorate and proved his qualifications for academic work by *Habilitationsleistungen*, which consist of a scientific research, oral examination, and trial lecture before the faculty in which the candidate desires to qualify. Usually three years must elapse between graduation and recognition by the university as private docent. The position carries with it the *venia docendi*, the use of university rooms for lectures, and an announcement of lectures in the university catalogue, but no salary except in rare cases. The docent charges fees, and the number of students whom he can attract depends entirely on his merits and ability. Accordingly some of the best work in the German universities is performed by the docents, more particularly as they are not hampered by the restrictions of an official position. (See FREEDOM OF TEACHING.) The professors are generally recruited from the ranks of the private docents.

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Register of Clark University.

DOCILITY. — The capacity for learning, in its widest sense. Royce, who uses the term to denote one of the fundamental characteristics of mind, defines it thus: " By the docility of an animal we mean the capacity shown in its acts to adjust these acts not merely to a present situation, but to the relation between this present situation and what has occurred in the former life of this organism." This capacity, together with sensitivity (*q.v.*) and initiative (*q.v.*) differentiates conscious from nonconscious organisms, and these three capacities constitute the signs of mind. On the physical side docility is conditioned by the plasticity of the nervous system by means of which any brain process is more likely to recur the more frequently it has been performed (law of habit, (*q.v.*). On the mental side traces are always to be found of the influence of former experience. The former experience may be either explicitly reproduced in consciousness (memory, *q.v.*), or it may have been so completely organized that it becomes effective without any explicit awareness of its presence. It may be added that the teacher is under peculiar temptation to overestimate the importance of docility, or tractable willingness of the pupil to accommodate himself to the ideas of textbook or teacher, at the expense of the other two factors mentioned. E. H. C.

See INDIVIDUALITY; INFANCY; INITIATIVE.

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ROYCE, J. *Psychology,* pp. 20–57. (London and New York, 1903.)

DOCK, CHRISTOPHER (1698–1771). — A schoolmaster reputed to have published the first professional book in America on education. He was born in Germany about 1698, came to America (probably) in 1718, and opened a school among the Mennonites near Philadelphia. His *Schulordnung* was written in 1750, but not printed until twenty years later. He died in Philadelphia in 1771. W. S. M.

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DOCTOR. (Latin *docere* to teach). — This term originally meant nothing more than teacher, and was used in the early period of the universities interchangeably with *professor* and *magister.* It was not, however, in common use before the middle of the twelfth century. Irnerius (*q.v.*), for example, is never given that title. The University of Paris conferred the title of doctor on Peter the Lombard and Gilbert de la Porrée at that period (1145). As the universities began to assume some form of organization, these terms of address became titles which could only be assumed after definite periods of study and with the permission of the proper authorities, the guilds or faculties composed of those already holding the titles. At first the universities differed somewhat in the use of the terms *doctor, magister,* and *professor.* Thus at Bologna the common titles were *doctor, professor,* or *dominus, magister* being rarely used. The jurists, it is true, attempted to arrogate the doctorate to themselves, but without success. At Paris *magister* was the title most commonly used in the faculties of theology, medicine, and arts, *professor* came next, and *doctor* was rare. This practice prevailed in other universities modeled on Paris. At Oxford the doctorate was retained for the superior faculties of theology, law, and medicine, and the title of *magister* for arts and grammar. The degree of doctor spread generally in the sixteenth century, and has survived in Germany, where the degrees of Doctor of Philosophy and Master of Arts are conferred simultaneously. In France the doctorate is the third degree (after baccalaureate and licentiate); in the English universities it comes after the bachelor's and master's degrees, except in the case of the Mus. Doc., which is equivalent to a master's degree in other faculties. The same statement is true of the American universities. The tendency in England and America has been to differentiate the doctorate according to faculties; this is brought out in the article on degrees (*q.v.*). The degree is also used for conferment by universities as marks of honor, and attempts are being made to differentiate between doctorate degrees conferred in course and *honoris causa.*

See DEGREES; UNIVERSITIES.

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DOCTOR OF PEDAGOGY. — See PEDAGOGY, DOCTOR OF.

DOLBEAR, AMOS EMERSON (1837–1910). — An educator prominent in the science-teaching movement. He was for twenty-eight years professor of physics in Tufts College, and pre-

viously professor in the Ohio Wesleyan University and the University of Michigan. He invented numerous scientific appliances, published a textbook on natural philosophy, and was the author of many works on science.
W. S. M.

DOMESTIC ART. — See HOUSEHOLD ARTS.

DOMESTIC ECONOMY. — A term until recently much in use to indicate the formal study of household activities, but now generally replaced by the term Household Arts (*q.v.*). One of the earliest examples of the use of this term appears to be 1778, in Robertson's *Hist. Amer.* I, IV, 320. "The functions in Domestic Economy are many, which fall to the share of women" (*New English Dictionary*). As a term used to denote an educational subject, it is found in the title of a volume by Miss Catherine Esther Beecher, *Treatise on Domestic Economy for the use of young ladies at home and at school* (Boston, 1842). The term "Department of Domestic Economy" is found in *A Special Report on Industrial Education in the United States*, 1883, by Mrs. Mary B. Welsh (United States Bureau of Education, 1883, p. 278). Mrs. Welsh says of this work in Iowa State College: "The first instruction in this department was given in 1872." Later, the department included instruction in cookery, house furnishing, care of the sick, care of children, management of help, dress, physiology, and "domestic chemistry." (See *The Home Economics Movement*, Bevier and Usher, Boston, 1906.) This term was used by the New York Industrial Education Association in 1885, and covered all branches of household work as then taught in its school. This term has passed out of common use in this country in educational work.

In England, the term "domestic economy" has been discontinued since 1904, in favor of "domestic subjects." *Économie domestique* is used in France and Belgium in the lower schools.

See HOUSEHOLD ARTS. H. K.

DOMESTIC EDUCATION. — See FAMILY EDUCATION; HOUSEHOLD ARTS.

DOMESTIC SCIENCE. — See HOUSEHOLD ARTS.

DOMINICANS AND EDUCATION. — The Dominicans from the beginning (1216) have been devoted to study and to the work of education. St. Dominic (1170–1221) desired to gather about him companions whose principal aim should be the salvation of souls through the ministry of the Word, and his order is officially designated The Order of Friars Preachers. Apostolic work demanded learning; hence Dominic (1215) conducted his first six followers to Toulouse to attend the lectures of a celebrated professor of theology named Alexander. The system of studies and of graduation observed in the order has been noticed by the historians of educational movements (see Drane, Douais, Vaughan). After completing the arts (classics) course, the student began the course of philosophy and theology. The most promising students were sent to a *Studium Generale*, the old laws requiring that each student be provided with three books, a Bible, the *Book of Sentences* of Peter Lombard (d. 1160), and a history, probably that of Peter Comestor.

At first there was but one *Studium Generale*, that of Paris. By 1248 four others were established, at Cologne, Oxford, Montpelier, and Bologna. The *Studia* were multiplied in the course of time, to suit the growing needs of the order. B. Albertus Magnus, St. Thomas Aquinas, and Peter of Tarentasia (afterwards Pope Innocent V) collaborated in framing a system of studies and of graduation which has been preserved substantially to the present time. The regulations adopted called for a long course of studies, frequent examinations, and successful teaching, as the candidate passed from the baccalaureate and licentiate to the degree of Doctor in Theology. This system produced a body of men well equipped for "the ministry of the Word," and well prepared to fill the chairs left vacant in the University of Paris, in the year 1228, when the masters of the university, in consequence of a collision between the civic and academic authorities, withdrew from the city. After a long controversy, in which William of St. Amour denied the right of the friars to occupy university chairs, St. Thomas and St. Bonaventure defending the claims of the religious, Alexander IV pronounced in favor of the "regulars." From this period dates the world-wide educational influence of the Dominicans and Franciscans. Their influence was exerted principally in the field of ecclesiastical studies, a term which includes philosophy, theology, Scripture, canon law, church history, and subsidiary branches, especially the science of languages.

Albertus Magnus (*q.v.*) (1193–1280) and his pupil, Thomas Aquinas (*q.v.*) (1226–1274), were the must renowned scholars and educators of the Dominican Order. Succeeding St. Thomas, and formed in his school, there came a host of Dominicans, known as "Thomists," prominent in educational work from the thirteenth century down to the twentieth, with a marked weakening of effort during the ravages caused by the French Revolution. Their activities were exercised, first in the University of Paris, Cologne, and Bologna, afterwards in other universities of Europe, notably at Oxford, Dublin, and Louvain. In the universities and in many seminaries they filled important chairs, often forming a majority of the professors. Outside of the classrooms they exerted a powerful influence by their writings, numbering in the thousands, which cover all departments of knowledge (see Quétif-Échard, *Scriptores Ord. Praed.*). In the departments of philosophy and theology there is an uninterrupted series of writers, amongst whom the following are the best known: Cajetan, Ferrariensis (commentaries of these two published in Leonine edition of St. Thomas' works), Capreolus, St. Antoninus, Francis of Vittoria, Medina, De Medicis, Dominic Soto, Peter Soto, Melchior Cano, Bannez, John of St. Thomas, Gonet, Contenson, Porrecta, Gatti, Gotti, Billuart, Goudin, Gonzalez, Zigliara, Lepidi, Dummermuth, Hugon, Pègues (the last six belong to the nineteenth century).

In the department of *S. Scripture* the Dominicans were medieval pioneers in the critical study of the Bible, whether in the original text or in translations. The Barnabite Fr. Vercellone (nineteenth century) says they were the first to resume the critical work of Origen (*q.v.*) and St. Jerome (*q.v.*). The *Correctoria* of the Latin versions were brought out almost exclusively by the Dominicans up to the year 1267, and they labored incessantly at this work until the authentic Clementine Vulgate was published in 1592. Hugh of St. Cher, in the thirteenth century, wrote the first biblical concordance. Santes Pagnini (d. 1541) was the first after St. Jerome to make a complete translation of the Bible from the original sources. Sixtus of Sienna (d. 1569), in his *Bibliotheca Sacra*, inaugurated the systematic study of the Bible, but " the real creator of the science of Introduction," writes Father Cornely, S.J., " was Father Thomas Milante" (d. 1742). It is worthy of note that as early as the thirteenth century the Dominicans sought to popularize the Bible. Their position at Paris makes it almost certain that they took a prominent part in producing the French version of that century (1226–1250). An elegant Italian version is attributed to James of Voragine (d. 1298), author of the *Golden Legend.* An Armenian translation, made under the direction of Bartholomew Parvus (d. *c.* 1360) appeared about the middle of the fourteenth century. Chronicles of the Dominican Sisters of Nuremberg in the fifteenth century prove that they and other nuns were employed in copying biblical manuscripts, and that they read the Bible in the vernacular. John Rellach and others translated portions of the Bible into German about the middle of the fifteenth century (more than sixty years before Luther's translation appeared).

The study of the Oriental languages was urged by the first general chapters of the order, that study being regarded as a necessary preparation for missionary work and for the scientific study of the Bible. Augustine Giustiniani (1536) opened the first official course of Hebrew in the University of Paris. He prepared also the first modern polyglot Bible in seven versions, and five languages, Hebrew, Chaldaic, Arabic, Greek, and Latin (three versions); an eighth column contained *annotationes et scholia.* Owing to lack of funds, only the Psalter was published. Raymond Martin (1286), author of the *Pugio Fidei*, was a distinguished Orientalist, speaking and writing with ease Hebrew, Chaldaic, and Arabic. In our own times the best traditions of the order are worthily upheld in the Biblical School of St. Stephen, Jerusalem. Through the *Revue Biblique* and various monographs, treating all subjects pertaining to biblical studies, Father Lagrange and his confreres hold high places in the list of Orientalists and biblical scholars. Father Scheil, the first to publish the *Code of Hammurabi*, is the greatest Assyriologist of France, being sent frequently on scientific missions by the French government.

St. Raymond of Pennaforte (d. 1275) was a promoter of various educational works. At his request St. Thomas composed the *Summa contra Gentes*, directed principally against the Moors of Spain. By composing, at the command of Gregory IX, the book of the *Decretals*, Raymond became the " Father of Canon Law " (*q.v.*). In this branch of ecclesiastical learning he had many followers, among whom some of the most celebrated are Thomas Bromyard (d. 1390), Thomas Turrecremata (d. 1648), and Peter Passerini (d. 1677). Church history, strongly recommended in the regulations for studies, received attention from the beginning. In this field the order is represented by many writers (see Introduction to any good history of the Church), the most noted being St. Antoninus (d. 1459), Graveson (d. 1733), and Natalis Alexander (d. 1724), whose monumental work is held in the highest esteem.

At Dublin, in 1248, the Dominicans opened (on Usher's Island) a school in which all branches of knowledge were taught gratuitously (see Drane, *Christian Schools and Scholars*, p. 443; *Dublin Review*, September, 1845). In 1563, Vincent Justiniani, Master of the order, saved the University of Freiburg (Breisgau) from extinction, by establishing a *Studium Generale* at Eulingen (Janssen, Vol. VII, p. 172). The University of Lima was established by the Dominicans in 1551, thus antedating Harvard by eighty-five years. They also founded the University of St. Thomas at Manila (P. I.). in 1645. President Taft, when he was Governor-General of the Philippine Islands, reopened the classes in this university. During the past two years two American Dominicans have been added to the teaching staff. At Rome the Minerva College (foundation dates from 1255) has ranked as a pontifical university since 1580. In 1890 Dominicans were placed in charge of the theological department of the University of Fribourg, Switzerland (founded in 1889). The professors of this institution are the editors of the *Revue Thomiste*, an esteemed theological periodical begun in 1892. Popular education was not a special aim of the Dominicans, except in so far as it may have been a necessary part of their apostolic mission; nevertheless, their labors contributed much to educate the people. St. Thomas' *Summa* furnished the material for Dante's *Divina Commedia.* Vincent of Beauvais' *Great Mirror*, a thirteenth-century encyclopedia, was, according to Rohrbacher (*Ecclesiastical History*, Vol. XVIII) "an epitome of all that man, up to that time, knew in nature, science, art, philosophy, and history." James of Voragine's *Golden Legend* (translated by Longfellow) was a manual of popular instruction. The writings of Tauler and B. Henry Suso exercised a powerful influence on German prose. Jordan of Pisa, Passavanti, Cavalca, and B. John Dominic contributed much to the perfection of the Italian tongue. St. Antoninus, Fra Angelico, and a host of others (see Cartier) elevated Christian art. Savonarola, by his preaching and writings, by his life and tragic death, taught lessons that have extended far beyond the Florentine Republic. College work has not been a special branch of Dominican activity. The old universities offered courses that would be considered college courses to-day. In many places the doors of the *Studia*, in which candidates of the order were trained, were opened to all promising young men; and in countries where colleges were wanting the Dominicans established colleges and schools, wrote grammars, geographies, and other manuals. Father Lacordaire, in 1852, founded the Third Order of Teaching Dominicans, who had several very prosperous colleges harboring the flower of young manhood in France, before recent decrees of the government came to hamper, if not to destroy, their educational work.

The Dominicans of the United States, being devoted almost exclusively to missionary work, have been compelled to confine their educational endeavors to the training of their own students. For many years studies have been organized in accordance with the strict requirements of the time-honored rules, and the new college (a *Studium Generale*) opened in 1905 near the Catholic University at Washington has revived the best traditions of the order. In the first half of the last century, in view of special needs, the Fathers of St. Joseph's Province (founded 1805) established colleges in Kentucky, Ohio, and Wisconsin, but withdrew in time from this field of labor in order to devote themselves to their own special work.

In Europe, during the last half of the nineteenth century, the venerable Father Guiglielmotti published a *Marine Dictionary*, the best work of its kind, highly esteemed in Italy and elsewhere. Father Henry Denifle, a scholar and educator of world-wide renown, published the *Chartularium Universitatis Parisiensis*, and other epoch-making works. He was journeying to England, to be crowned as an honorary doctor of the Cambridge University, when death claimed him at Munich (June 10, 1905). Father Weiss, professor in the University of Fribourg (Switzerland), is hailed as a distinguished apologist and an authority on social questions, whilst the superior style of his writings marks him as a master of German prose. His confrere, Father Mandonnet, is a noted historian and writer. His monograph on *Siger de Brabant* is a standard for the history of Averroism. Father Monsabré's *Exposition du Dogme Catholique* (Conferences at Notre Dame, Paris) probably has never been surpassed as a popular, scientific, and yet theological explanation of Catholic doctrine. Exiled French Dominicans, now located at Kain, Belgium, publish the *Revue des Sciences Philosophiques et Théologiques*, which has received much praise.

The Dominican Sisters, whether of the Second Order (inclosed) or of the Third Order, deserve more than a passing notice. The work of the Second Order was limited to receiving a small number of girls to be educated by the Sisters. In 1609 the Convent of Avignon received as a member of the community the Ven. Juliana Anna Morrell, who had publicly defended theses in philosophy and theology, and who was generally known as "The Doctoress." The Conventual Tertiaries have devoted themselves to educational work in all countries where they have been established, especially in England, Ireland, and America. Mother Raphael (d. 1893), better known as A. T. Drane, was a highly gifted writer. Her *Christian Schools and Scholars*, a monumental work, is a history of education from the beginning of the Christian era to the Council of Trent. In the United States to-day there are more than three thousand Dominican Sisters, divided into congregations or provinces, and who are devoted to educational work in orphanages, schools, and academies. Their field of labor extends from Canada to the Gulf of Mexico, from the Atlantic Ocean to the Pacific slope. Three Congregations, viz., Holy Rosary (Mother house, Sinsinawa, Wis.), St. Mary's of the Springs (Mother House, Columbus, Ohio), and Holy Name (Mother House, San Rafael, Cal.), offer courses which are officially recognized by the state universities of Wisconsin, Ohio, and California.

The rules of study and of graduation now in force in the Dominican Order are as follows: (1) After classics, seven or eight years of study of philosophy and theology (four of the eight years devoted to the *Summa* of St. Thomas), there being frequent examinations and exercises in speaking and writing — lead to the lectorate (*Sacrae Theologiae Lector*, S. T. L.). In 1907 the General Chapter of Viterbo prescribed two years of supplementary study, *i.e.* after obtaining the lectorate, in a university before a Lector can be assigned to teaching. (2) After seven years of successful teaching, the candidate who has written a scientific work or a valuable dissertation may be admitted to pass the *Examen ad Gradus*, and becomes a Lector Praesentatus, *i.e.* a lector presented for the mastership. (3) Six years more of successful teaching lead to the title of Master (S. T. M., *i.e. Sacrae Theologiae Magister*). The degree is conferred by the Master-General of the order, on petition of the province to which the teacher belongs. D. J. K.

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DONATUS, ÆLIUS (fourth century A.D.). — A Roman grammarian and rhetorician, an author and a teacher of renown, numbering St. Jerome among his pupils. He produced a number of commentaries of note, especially those on Vergil and Terence. His *Ars Grammatica,* written about the middle of the fourth century A.D., formed the basis of nearly all of the treatises on that subject written during the Middle Ages, and was itself the most generally used text on that subject. The second of the three parts, *On the Eight Parts of Speech,* was even more widely used; so generally, in fact, that the term *donat* was used in the literature of that time, as in Chaucer and Langland, as synonymous with an introduction, as a *Donat into Christian Religion.* This abbreviated form was practically a primer, as in ordinary type it is only eight or nine pages in length. It was still commonly used, ordinarily with a vernacular interlinear, in the seventeenth century. This grammar, either in its full or abbreviated form, is one of the commonest of early printed books, and exists yet in more than a thousand manuscripts of earlier date.

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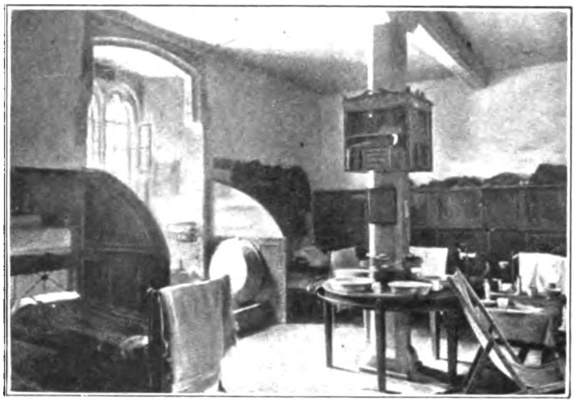
DORMITORIES. — The historical connection of dormitories and boarding clubs with the development of units of organization and administration in colleges and universities has been shown in the article upon Boarding Schools (*q.v.*). (See also CAMBRIDGE; OXFORD; PUBLIC SCHOOLS; UNIVERSITIES.) In France and England, where the *internal* type of schools predominates in the education of the upper classes, the various forms of sleeping rooms which are found go back to two general classes. (1) An open hall in which the persons either (*a*) sleep in beds arranged in rows, or (*b*) are separated by low wooden partitions with hangings at the entrances. (2) Separate cells opening on a corridor. The primitive form was used by the Benedictines, and was brought back among the Cistercians by Bernard, but the more luxurious members at Cluny allowed the greater differentiation in the tenth century and it became the type after the fourteenth century. Modern usage, especially in America, often applies the term to the earlier college, where students lived in chambers, or to the quasi-public boarding house. The various methods of arrangement discussed in modern schools go back to these ancient forms for instance, the cubicle, which is accounted in some schools a satisfactory mean between the extremes, is derived from 1 (*b*). The problems of places for eating, recreation, work, etc., are involved, and one finds interesting variations in meeting these, as the little "dens" for study at Rugby and the large study halls of some other schools, each considered superior to others by those using it. Difficulties of economical heating have seemed to justify some conditions of the past, but the subject has had remarkably little expert attention, and present arrangements lag far behind modern progress in heating and ventilation.

England. — The dormitory has played a more important part in student life in England than elsewhere, since so much of the training of the boy is furnished through the life as there organized. That dormitories were used from the earliest time by the large English schools is quite clear, for there are among the manuscripts at Westminster Abbey some elaborate rules for the behavior of the boys in the choir school, and these rules give some general idea of

Wren's Dormitory: Westminster.

Cubicles: Charterhouse.



A Chamber: Winchester.

A Cottage: Eton.

Dalton Hall: Manchester University.
A Modern City Dormitory.

Street Front of Cottages: Eton.

TYPES OF DORMITORIES.

the sleeping arrangements provided for the boys. The rules say (*inter alia*), " when they get up in the morning therefore they should mark themselves piously with the sign of the cross. . . . They must cover their beds with their mats and coverlets properly and leave their chamber quietly and without noise altogether, and must wash their hands and go to the church modestly, not running or jumping or chattering. . . . Whoever at the hour of going to bed upsets the bed of his companions or hides his clothes or throws his shoes or his pillows from one end of the room to the other, or loses his temper, or disturbs the dormitory, is to be severely punished on the next day; when they go to bed they are to behave in the same way as when they get up, marking themselves and their beds with the sign of the cross." Here is presented a clear picture of a dormitory in the thirteenth century, and it is certain that for centuries after this time the same method of providing sleeping accommodation prevailed. Indeed, much the same system is found to prevail at Westminster in the nineteenth century. In 1839 Frank Buckland (the naturalist) writes concerning Winchester: " The beds in ' chambers ' are, I believe, as old as William of Wykeham himself; they are made of very thick oak planks, and there is a hollow for the bed clothes, after the style of the beds for foxhounds in kennels." Buckland went through the processes of " launch " and " toe fit tie." In the first case, the mattress and sleeping boy are dragged into the middle of the room; in the second, whipcord is tied round the big toe of the boy, " the whip cord was so ingeniously twisted among the beds that it was impossible to find out who pulled it." The latest arrival in college is called " Junior in chambers " who had, in Buckland's time, to get up when the early chapel bell rang, call all the boys, light the fires, put out the prefects' washing tubs, clean (on Sunday) the wash and basins at " conduit " (two water taps in the open), make coffee for the prefects, clean the knives, make plum puddings, etc. (See FAGGING.) The only change that has come over or into the average school dormitory is the introduction of the cubicle. It will be convenient to describe two modern dormitories, one in a somewhat small school (Giggleswick) and one in a great school (Eton).

The mass of the boys at Eton live in " houses " under housemasters, and in the houses each boy has a separate bedroom used as a study by day, the beds being turned up to the wall. Seventy boys are on the ancient foundation as scholars, and these live in " college" (a separate block of buildings consisting of the original school buildings and some nineteenth century additions). At the present time only the lowest fifteen of the boys in college live in " Long Chamber." This was originally a long room large enough to accommodate the whole of the seventy scholars. It has now been reduced to a fraction of its original size, a large part of it having been divided into separate rooms for the older boys. The remaining part is still called " Chamber." It is divided into fifteen cubicles by wooden partitions. The partitions go only about one third of the way up the walls, being about eight feet high. A curtain is arranged at the front of each cubicle, or " stall," as it is called. Each stall is fitted with a bed, which folds up into a kind of tall wooden box, a writing bureau surmounted by a book cupboard, and comprising drawers for clothes, a windsor chair, bath, and tin pan for dirty clothes. In the center of the wall or " chamber " is a fireplace, opposite to which is an old round oak table; the external walls of the cubicles on either side of the fireplace have benches fixed to them. On the table there is always kept a jug of drinking water from the old pump in the cloisters on the other side of the open " school yard." " Chamber " is managed by the top boy in it, who is called " Captain of Chamber." It is his duty to keep order day and night, though at the time when " chamber " is going to bed, a member of sixth form always patrols to see that all is orderly. The boys take it in order to keep up the fire in winter and to keep the waterjug filled. The captain has power to enforce his orders by mild corporal punishment, administered either with a hair brush, or a "syphon," that is a rubber tube used to convey water from the taps to the baths. All the boys in " Chamber " are " fags." And every boy in " Chamber " has to run to the summons when a member of sixth form or headmaster's division calls "Here!" within earshot. "Chamber" has a life of its own; its own debating society, its own games of cricket and football, made up to the requisite size by the inclusion of the necessary number of boys from those next above " Chamber," a separate room (called " Chamber Tearoom ") for its meals, its own athletic sports and (single wicket) cricket, and rowing sweepstakes. Moreover, it has annual matches against the inhabitants of the other tearooms (known as Chamber *v.* Tearoom), which arouse considerable interest in college.

At Giggleswick the four chief dormitories are about seventy feet long, by thirty feet wide, and fifteen feet high. There are in each some twenty-four cubicles twelve feet by six feet (ranged on each side) partitioned by pitch pine boards eight feet high. Each cubicle is set from the outer wall, and contains a bed, a dressing chest, a washstand, and a chair. There is one small dormitory. The long dormitories are controlled by two " seniors," the smaller one by one " senior." With the exception of some double rooms for brothers, the whole school is boarded on the dormitory system. The continuous use, for many centuries, of the dormitory system is one of the " notes " of English education. It is to be remembered that it never extended at any time to Oxford or Cambridge.

Germany. — In German discussions of the subject, the term *Pensionat* is reserved for conditions in which the family type predominates, and it does not include living arrangements in which the family life is lost. Dietsch, in an article on *Alumnate* in Schmid's *Encyclopedia*, notes the following groups: (1) *Zellenwirthschaft* (two students in a room in which they work and sleep); (2) *Stubenwirthschaft* (four in a workroom with adjoining sleeping rooms); (3) *Saalwirthschaft* (ten or twelve in a workroom, with two or three times as many in a dormitory). In some of the states of Germany, any scheme which departs from the barracks form of dormitory for boys in boarding schools is effectively discouraged by the governmental authorities. The reason given is that the students will become unfitted for the accommodations furnished during the term of military service.

United States. — The state institutions in this country have attempted to keep free from responsibility for the living accommodations for their students. This has been due in large part to inadequate provision of funds. Usually when dormitories have been provided they have descended from some earlier form of the school under private control, or have been established as a result of some special influence. There has been a growing tendency to exercise greater authority over students in these matters, as *e.g.* a ruling sometimes found that girls must not room in houses in which no provision is made for receiving callers. Spasmodic efforts at inspection have revealed most appalling conditions taken as a matter of course, and there is a growing sense of responsibility for meeting needs more adequately. The University of Wisconsin has a definite policy, which is coming into operation as fast as funds are made available. The University of Michigan, through its Women's Union, is making a beginning in the control of several houses for residence purposes. The movement, in general, is toward more homelike conditions. Often there has been a failure to take account of the effect of several years' life during the growing period, in which the place basis is lacking in the development of the instincts of ownership, as well as other important tendencies. There is a marked difference in the evidence of certain interests and activities in the life of a boarding school boy who has some place to call his own and another who has nothing but a locker or a drawer in which to center his material possessions.

Serious criticism of existing conditions in our colleges has often been made, but for the most part, the only serious attempt toward meeting this need in recent times has fallen to the Greek letter fraternities (*q.v.*). Where the fraternities have been strongest, during the quarter of a century in which they have provided houses or lodges, the colleges have ceased to build new dormitories. Thus at Amherst, in 1870, fifty-three per cent of 225 students were in dormitories; in 1905, 24 per cent of 455 were in dormitories and 43 per cent in fraternity houses. Thus the answering of the problem of finding at least a partial substitute for college home life has been left largely to the students. The financial aspects of the student housing problem are very important, whether attempted by the students or by the college. The modern dormitory represents a permanent investment of from $500 to $2000 for every student housed.

Other aspects of this problem are discussed under other subjects. See Boarding School; College; Fraternities; Private Schools; Universities.

J. E. G. de M. and F. A. M.

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DORPAT, UNIVERSITY OF. — Founded in 1632 by Gustavus Adolphus, but closed under the rule of Peter the Great of Russia. It was restored in 1802, and in 1803–1804 became one of the imperial universities. The statutes and regulations have been revised several times, the last revision being in 1884. In 1892 the official title became the Imperial University of Jurjev. Faculties of theology, law, medicine, arts, and sciences are maintained. The instruction is carried on in Russian and German. The town has a large German population, and the university is a stronghold of German scholarship in Russia. At one time a department for the training of professors was maintained. (See H. Barnard, *Superior Instruction*, p. 839. Hartford, 1873.) In 1909 there were enrolled 2815 students, of whom 1233 were in the medical faculty.

DÖRPFELD, FRIEDRICH WILHELM (1824–1893). — A distinguished German schoolman and educational writer of the Herbartian school. Born in Sellscheid in the Rhine province, he attended the teachers' seminary in Mörs, and became, in 1850, teacher and later on principal of a school in

Barmen, where he taught for thirty years. In 1880 he was retired, and the rest of his life was devoted to literary activity. Dörpfeld's chief service to pedagogy consists in his application of Herbart's ideas to the theory and practice of the elementary school. For this he was well fitted on account of his philosophical insight and his school experience. His work on *Denken und Gedächtnis* (1886), (*The Connection between Thought and Memory*, edited in English by Herman T. Lukens, Boston, 1895), is still one of the most valuable monographs in pedagogical psychology. Dörpfeld, however, took a great step in advance of Herbart in emphasizing the social side of education. He advocated an elementary study of sociology in the school, not as a separate subject of instruction, but rather as a point of view in the treatment of history, geography, and other studies. With regard to school organization, he strongly favored the institution of self-governing school communities, the internal affairs of which should be free from the interference of both Church and State. His complete works were published in 1894. F. M.

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DORT, SYNOD OF. — The most notable synod of the Reformed Dutch Church, assembled 1618–1619, in Dort (Dordrecht) at the call of the States General of the United Netherlands for the purpose of committing the church to Calvinism. Delegates came from the provincial synods, the several states, and from Switzerland, Germany, and England. Education received attention. Catechizing was regulated. Schools were demanded, "not only in cities, but also in towns and country places where heretofore none have existed." Request was made of the magistrates for properly qualified teachers, and "that the children of the poor may be gratuitously instructed." Church attendance of pupils was required. All teachers, of whatever grade, must sign the confession of faith as newly interpreted. Local and general ecclesiastical visitation of schools was provided. The States General were petitioned to reform trivial schools and universities. Doctrinally, the influence of the synod was great; and in the more stringent enforcement of the creed the schools were affected. On the whole, educational development was not much furthered. The special school enactments were little, if at all, in advance of previous similar enactments or of general public opinion, and besides had to depend for their enforcement upon the ordinary school laws of the several cities and states.

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DOUBLE IMAGES. — The two eyes always receive impressions from any object in the field of vision. These two images are ordinarily fused. (See Fusion; Binocular Vision.) In some cases, however, the fusion is impossible; then the individual derives a separate experience from each of the images and is disturbed by double vision of the object. One of the simplest methods of producing double images is to push one eyeball out of its normal position. The image from a given object then falls upon a portion of the retina which is not usually related to the portions stimulated by the same object in the other eye. The two images are then said to fall on noncorresponding points of the retina. (See Corresponding Points.) In some cases the movements of the two eyes are of such a character as to cause the images to fall on noncorresponding points. Such conditions arise in various forms of intoxication, when the nerve centers which control movement are incapacitated, and in certain pathological cases, such as diplopia. Certain abnormalities in the development of the eye muscles make it difficult for the individual to move his two eyes in perfect coördination. Such conditions sometimes depend on the different strength of different muscles, sometimes on their mode of attachment to the eyeballs. In either of these cases, normal visual perception is interfered with or is rendered impossible, or is achieved only at the expense of great physical effort. The correction of these difficulties is sometimes effected through surgical operations, sometimes through systematic training of the eye muscles, sometimes through the use of prismatic lenses. The failure to develop the proper coördination of the eye muscles is one of the very fertile causes of eye fatigue, and since no direct sensations from the fatigued muscles are provided, it is a very subtle form of abnormality. C. H. J.

DOUBLE TRANSLATION. — That practice in the teaching of a foreign language where the foreign text is translated into the vernacular and the vernacular rendition retranslated into the foreign tongue, the final translation being then compared with the original text. The method of double translation has been used mainly in the teaching of the classical languages, particularly Latin. In a modified form it is being widely introduced at present, particularly in the more recent English textbooks in foreign languages. It was probably a current method of the humanists in the period of their ascendency. It was used in Johann Sturm's Gymnasium at Strassburg, and recommended as a method by Roger Ascham in his *Scholemaster.*

See Ascham, Roger; Greek, Study of; Latin, Study of; Translating.

DOUBT. — A state of incomplete or suspended judgment, to be distinguished from belief, either in its positive or negative form. Doubt is closely connected with the formation of belief. In the case of some particular belief, doubt may antedate certainty. Yet in many cases, doubt comes only after belief has taken form; and the belief, becoming then temporarily dissolved and tested, recrystallizes into its old form or into a new. For doubt to come *between* belief and belief, rather than to come either first or last, seems to be the normal course. In the history of the race and of the individual, doubt comes into prominence only at a late stage. The child, or the savage, forms his judgments less hesitatingly than does the more sophisticated man. This hesitation, which is useful so long as it tends to make belief more intelligent and more in harmony with wide experience, often far outlives its period of usefulness. Doubt now usurps the place of belief, and instead of aiding judgment makes judgment impossible. In certain diseased conditions, belief is thus perpetually hindered, and practical conduct becomes impossible because of unconquerable indecision.

G. M. S.

See Belief.

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See also the references under Belief.

DOVER COLLEGE. — See College; Colleges, English; Grammar Schools; Public Schools.

DOWNES, ANDREW. — Regius professor of Greek in the University of Cambridge, 1585–1624. During the forty years of tenure of this post, Downes, " a scholar composed of Greek and industry " (as Fuller says), raised greatly the prestige of Greek studies from the low point they had reached in the latter part of the sixteenth century. From 1562 to 1567 as a boy, Downes was at the famous school of Shrewsbury, under Thomas Ashton, the first master. In 1593 Downes published the *Eratosthenes* of Lysias, in the dedication of which he declares that next to God and his parents, he owed most to his old schoolmaster. Downes was one of the collaborators in Savile's noble Eton edition of the work of St. Chrysostom (see Bois, John), the greatest English edition of a classic author produced up to 1613. Downes was described by his contemporary Simonds D'Ewes (*Diary*) as " accounted the ablest Grecian of Christendom being no native of Greece," though this was absurd, with Scaliger (*q.v.*) and Casaubon (*q.v.*) living. Downes was appointed one of the translators of the *Apocrypha* for the authorized version of the Bible, and was one of the six final revisers (see Bois, John), but it was said of him that he would never leave Cambridge for the writings at Stationers' Hall " till he was either fetched or threatened with a Pursuivant." He was a correspondent (in Greek) with the great scholar, Isaac Casaubon (*q.v.*).

F. W.

DRAINAGE OF SCHOOLHOUSE AND GROUNDS. — See Architecture, School.

DRAKE UNIVERSITY, DES MOINES, IA. — A coeducational institution opened Sept. 20, 1881. The departments include the college of liberal arts (1881), admission to which is by examination or certificate from an approved high school, and the college of the Bible (1881); the college of law, organized in 1875, was for six years a department of Simpson College, Indianola, Ia.; it was affiliated with Drake University in 1881 and purchased by the university in 1902; the original college of medicine, organized in 1881, and for the succeeding five years known as the Iowa Medical College (eclectic), was discontinued in 1887, when the Iowa College of Physicians, a private institution, became the medical department by affiliation. In October, 1908, the Keokuk Medical College, an institution which, under various names, had existed since 1844, was merged with the university school. The college of dentistry, established in 1897 as a department of the Keokuk Medical College, became a department of the university in 1908, when it succeeded the Des Moines College of Dental Surgery, affiliated with Drake University in 1900, but discontinued in 1906 for lack of support. The present school is well equipped. A college of pharmacy was organized in 1882, became an affiliated department in 1882, and a regular department in 1902, but was later discontinued for lack of support. In 1888 a normal department was established, now called the College of Education; it maintains a summer school, organized in 1890. The college of fine arts consists practically of the conservatory of music. Drake University suffered during its earlier career under the imputation of commercialism in its management and acquisition of schools. Its recent progress has, however, been rapid in the direction of higher standards.

Under an amended charter of June 12, 1907, the Board of Trustees became a self-perpetuating body of twenty-five members, including the president *ex officio*, without denominational restrictions of any kind. There are (1909) twenty-one life trustees who obtained office by giving $1000 to the university; this form of membership has been abandoned. Six trustees of the twenty-five are nominated by the alumni. On Feb. 6, 1908, the university was accepted by the Carnegie Foundation for the Advancement of Teaching (*q.v.*). The total productive endowment (1909) is $432,351.17, producing an income of $24,787.94. The total income is $112,256.73; there is a debt, unprovided for, of $28,500 (1909). Grounds, buildings, and equipment are valued at $384,640.68. There were enrolled in 1910–1911, 1843 students. C. G.

DRAMA AND EDUCATION. — If "drama" be taken in its widest sense as action (*δράω*) it will include all forms of imitation which find expression by means of action. Thus a large proportion of the educational development of animals and human beings which springs from the "play" impulse is cognate to the drama. The little child who satisfies the "make-believe" desire is perpetually in the domain of the drama. The action games of the kindergarten are profoundly dramatic. All the imitative worlds of gesture and assumed speech, and accordingly all recitation and declamation, verges on the dramatic and easily passes over into it. Many forms of music, dancing, dress, and decoration, implying imitation through action, assume elemental qualities of the drama. Nor is it too much to affirm that however emphatic artists may be to-day, that art is to be practiced for art's sake, the origins of art, as the term implies, were distinctly practical. Every art was originally practiced to obtain some practical end, and required for its transmission the intervention of education. It is evident, for instance, that dancing, music, painting in earlier stages, constantly had religious purposes before them, and some of the greatest efforts of human art have been produced under the religious impulse. The drama in Greece arose out of the connected worship of Dionysus, Bacchus, Apollo, and Demeter. Even in the time of Pericles, the plays were acted at the festival of Dionysus. The dramatist had still to provide a satyric drama, in which the chorus was composed of the attendants of Dionysus. But the spirit of the drama of Æschylus, Sophocles, and Euripides rose to the highest topics — to the relations of gods and men, and the fate or destiny that ruled supreme over both gods and men. And in the Golden Age of Athens, it was the great desire of Pericles to throw open to all the people the supreme pleasures of the highest art. Accordingly, since the arrangements of the Athenian theater required a fee for admission, Pericles distributed out of the public funds the amount to each person (who needed the gift) to enable him to attend the theater at the feast of the Dionysia. The theater thus became a national educational institution, and an exceedingly powerful one. It has been said the Greeks were a nation of actors. Boys recited Homer, or Æschylus, or Euripides, and gave free play to gestures and delivery of speech, and the frequent dramatic representations served as models. The boys were, as Plato feared in the *Republic*, likely to become vulgarized by the realism of their dramatic methods. He was keenly alive to the educational value of the drama. He realizes that a boy gradually *becomes* the thing he imitates, for better or worse, and he therefore insists that in all artistic pursuits the boy must only be given free scope for that which is calculated to draw out the best in human nature. Imitation in which impersonation is involved, where the reader, and, still more, the actor, identifies himself with the character represented, *i.e.* precisely what is meant by the dramatic, is, for Plato, so vivid a form of experience that it must be restricted to such subject matter, and such types of characters, as make for the betterment of the human soul. It is this extremely vivid appreciation of the educative aspect of the drama that gave rise to the function of the much-challenged censor. The drama was thus recognized as having an absorbingly important educational aspect in classical Greece.

Amongst the Romans, in the celebration of the festivals, the theater ranked next in general popularity to the chariot race and the gladiatorial contests. It is said that under Constantius 101 days in the year were devoted to *ludi scenici*. So powerful was the stage that Trajan boasted that theatrical displays controlled Rome. The stage was, indeed, degenerate, and presented chiefly farce and pantomime, and sank to infamous immorality. But the educative influence for good as well as for evil was even then undoubted. It is said that Arius had intended, at one time, to set up a Christian theater to supersede the loose spectacular entertainments of the decadent stage.

Through the Middle Ages, the regular drama of tragedy and comedy was obscured and gave way, predominantly, to other forms of entertainment, in which, however, the dramatic instinct was not lacking. The dramatic element was represented by minstrelsy of various kinds, in satisfying the "deep-lying instincts of the folk." And through village festivals the dramatic necessarily showed itself, until there were developed the festival plays, with many secondary dramatic forms.

But apart from these popular modes of self-expression, there are traces of the drama as a consciously educative force. In the first century A.D., Publilius Syrus composed his Mimes, and though the ethical element was decadent in the early centuries A.D. of the Roman drama, Syrus oftentimes gave forth *sententiæ* which were esteemed throughout the Middle Ages and onwards into the seventeenth century. In the fourth century A.D., Ausonius (*q.v.*), a schoolmaster of Bordeaux, wrote the *Ludus Septem Sapientum*. This consists of a series of recitations for each of the "seven wise men." It should be remembered that in 1659 Charles Hoole compiled a textbook for young pupils, which contained (along with Cato's distichs *De Moribus*) both the "Excellent sayings of the Seven Wise Men of Greece" and Publilius Syrus' *Stage Verses*, or Seneca's *Proverbs* (both in Latin and English) "whereby little children may understandingly learn the rules of Common Behaviour," showing a recurrence to the old Roman drama for maxims of edification. In the tenth century A.D. Hroswitha, the Benedictine Abbess of Gandersheim in Eastphalian Saxony, wrote religious and moral plays to replace the comedies of Terence, evidently recognizing the educative power of the drama. After the Norman Conquest there are from time to time notices of the monastic literary drama, *i.e.* plays founded upon the classical models, but with Christian subject matter. Thus at Dunstable in 1110 there was a play acted by scholars in honor of St. Catharine. From 1170 to 1182 were acted a series of saints' plays mentioned by William Fitzstephen. Popular church festivals, sometimes assimilating pagan methods and material, together with survivals of the popular ancient dance and song, gave impetus to dramatic development. Thus the feast of the Innocents was associated with the celebration of the election of the Boy Bishop (*q.v.*), elected by his fellow choir-boys on the feast of St. Nicholas, the patron saint of children. With this celebration sprang up dramatic performances, and thence probably the play acting of chapel boys and schoolboy companies of actors.

In the later medieval period, schoolboys from the numerous chantry and other schools literally played important parts. In the service of the Church, at which they attended and assisted, the whole symbolic, mystical service had the dramatic element, exemplified in alternating song and visible action. The dramatic "mystery" was thus developed from the church liturgical service. The "mystery" was thus an active dramatic form of presentation of the scriptural stories, as the depicting on canvas and on glass and on pavement mosaics was the pictorial representation of the Christian story. The artistic forms of representation were thus in the hands of the clergy the surest forms of interesting the masses by visualization of Scripture story in an age before the printed book had made necessary the learning to read. Thus mysteries (Bible plays), miracles (saints' plays), and moralities (stories of personified moral qualities) were closely connected with the ecclesiastics and their pupils as the leaders of popular religious education. In the morality, the struggle between good and bad personified powers in the soul takes place for the possession of the whole man — a topic first discussed in Christian literature in the *Psychomachia* of Prudentius (*c.* 400 A.D.). Prudentius (*q.v.*) was a commonly read author in the schools — hence the idea of the morality found ready prepared ground in the school training. Schoolmasters were not infrequently the writers of moralities, *e.g.* Ulpian Fulwell, author of *Like Will to Like* (1568); and frequently the topics themselves were educational. Thus the *Interlude of the Nature of the Four Elements*, by John Rastell, son-in-law of Sir Thomas More, introduces man prompted to study geography by *Natura naturata* and Studious Desire, and restrained by sensual Appetite and Ignorance. A play called the *Marriage of Wit and Science* was written by a Schoolmaster, John Redford by name. The hero Wit slays the monster Tediousness by his enthusiasm for study. In *All for Money*, Thomas Lupton (*c.* 1578) introduces the *personæ dramatis*, Learning-with-money, Learning-without-money, Money-without-learning, Neither-Money-nor-learning (see *Cambridge History of English Literature*, Vol. V, p. 57). It is thus clear that if these *origines* of the drama are ascribed to ecclesiastics, schoolmasters also were closely connected with the writing of the dramas, and schoolboys with their acting.

In 1427 the twelve lost plays of Plautus were recovered, and, besides the opportunity thus given for the reading of those plays, their discovery suggested to aspiring Latinists the imitation of their Latinity, and the dramatic form. The fact that scholars conversed in Latin made the discovery of the Latin conversation of the newly found dramas of especial importance, as models for speaking and for imitation in composition. Ravisius Textor, while professor of rhetoric in the College of Navarre in Paris, wrote dialogues in Latin for his pupils to recite dramatically. Terence and Plautus were the authors especially studied by the young student, in the time of the Renaissance, so as to cull the phrases best suited for conversation. J. L. Vives, in 1531, says "Terence is of importance for daily conversation." The colloquy was the daily study of the little boys for Latin speaking, and the older boys of the school were required to act scenes from the Latin dramatists. Eventually a school play became an institution for state occasions, and even a regular part of the time-table. Early in the sixteenth century the school play was established in Germany, Holland, and England. As to Germany, Professor Herford says, "The *Rath* not unfrequently contributed to the often considerable cost of school-plays and at Strassburg gave them an appointed income from the municipal budget." The early Dutch school dramatists gave rise to the various treatments of the gospel parable of the Prodigal Son.

The most famous plays founded on this parable were the *Acolastus* of William Gnaphæus, (1528), the *Rebelles* (1535) of Macropedius, and the *Studentes* of Christopher Stymmelius (1549). (See PALSGRAVE, JOHN, English translator of Gnaphæus' *Acolastus*.) Other scriptural subjects gave rise to plays directly based on the Roman dramatists. During the Reformation period, the drama became an instrument for presenting Protestant views, *e.g.* in the *Pammachius* of Kirchmayer, written in 1538 and translated into English by John Bale. In England, the use of biblical and didactic subject matter was quite as characteristic of the play writers, as it was abroad, and schoolmasters were quite as much to the front. Not only were there translators of foreign biblical plays, such as John Palsgrave and John Bale, but English schoolmasters composed plays for their own pupils to act.

Professor Schelling (*Elizabethan Drama*, Vol. I, p. 94) draws attention to the fact that the earliest English playwrights were schoolmasters or courtiers, and amongst the schoolmaster pioneers of the Elizabethan drama he names Radclif, Rightwise, Palsgrave, and Udall. Ralph Radclif (1519–1555) is known from the reference to him by John Bale in the *Catalogus Britanniae Scriptorum* (1557–1559). He held his school in the disused Carmelite Monastery in Hitchen (Hertfordshire). He used as theater the refectory of the old monastery, and trained his pupils to act the plays he wrote, with a view to securing good enunciation and freedom of manners in the pupils. In addition, Radclif wished to make known the Scriptures by some of his dramas, dealing with such subjects as *The Delivery of Susannah*, *Job's Sufferings*, *The Burning of Sodom*, *Jonas*, *The Fortitude of Judith*. Some of his plays show the introduction of strong religious bias, *e.g.* the *De Joannis Huss Bohemie nati condemnatione*. John Rightwise, son-in-law of William Lily, and his successor in the headmastership of St. Paul's School, wrote a Latin tragedy, *Dido*, which in 1532 was witnessed by Cardinal Wolsey, — though a Latin morality ridiculing Luther and his wife had been acted before King Henry VIII by the St. Paul's schoolboys in 1527. It is supposed that Nicholas Udall's *Roister-Doister* was written for the Eton College boys between 1534 and 1541. This play, founded upon the *Miles Gloriosus* of Plautus, is the starting point of the modern English comedy, and comes thus direct from a schoolmaster author, and was first acted by schoolboys.

We have thus seen that the drama at its best in ancient Greece and Rome had popular educational aspects from the ethical point of view, and in the Middle Ages was used for popular education in religion, while with the Renaissance, the drama actually entered the schools, and was used as an avowed educational instrument in the school. The opinion of Lord Bacon on the educative value of the drama has an especial interest, as coming from so great a contemporary of Shakespeare. It occurs in *De Augmentis Scientiarum* (Bk. II, ch. xiii), 1623. " In modern states," says Bacon, " play-acting is esteemed but as a toy, except when it is too satirical and biting; yet among the ancients it was used as a *means of educating men's minds to virtue*," and in Bk. VI, ch. iv, occurs the following statement on the *raison d'être* of the relation of the drama to school education in the view of the early part of the seventeenth century. After claiming that the Jesuits attach importance to school acting, and in Bacon's opinion " therein judging (as I think) well. It is a thing indeed, if practised professionally, of low repute; but if it be made a part of discipline, it is of excellent use. I mean stage-playing; an art which strengthens the memory, regulates the tone and effect of the voice and pronunciation, teaches a decent carriage of the countenance and gesture, gives not a little assurance, and accustoms young men to bear being looked at."

The use of the drama for polemical purposes is closely bound up with the educational motive, as is seen in the Reformation school dramas. But in the later sixteenth and seventeenth centuries, with the development of the acting of the Elizabethan drama in recognized public theaters, the school drama was differentiated as a pedagogical institution. Westminster School is worthy of note in this connection, since the school plays, especially those of Terence, with Latin prologue and epilogue dilating humorously on the events of the day, have gone on regularly, and continue still to be rendered annually on the second Thursday in December, and the Monday before and after that day. This is in accordance with the statutes of Queen Elizabeth (the school existed long before these statutes), *c.* 1560. Nicholas Udall, who was headmaster of Westminster before this date, viz. *c.* 1554–1556, had been headmaster of Eton, and had had his *Roister-Doister* performed by Eton boys before 1541. Even before writing this comedy, Udall had shown his interest in the ancient drama by translating *Flowers of Latin Speaking* from Terence, *c.* 1533.

Mr. John Sargeaunt, the historian of Westminster School, says the fact of having the annual play was no " special mark " of the school. " Acting was generally regarded as a necessary part of education. There was perhaps no school of note which did not frequently put upon the stage both the dramas of Plautus and Terence, and those dull Latin comedies of which the age was so prolific." Mr. Sargeaunt notes that " after the Puritan epoch, the Westminster play was the sole survivor, and this survival is to be explained by the fact that by the statutes, penalties were to be inflicted for any omission at Christmas of a Latin play from the Westminster schoolboys and an English play by the choir-boys." Dean Nowell was headmaster of Westminster school before the Royal Statutes of 1560, and it was he who in 1543 "brought in the comedies of Terence for the better learning of the pure Roman style." Shrewsbury school, which Camden states had more scholars than any " one school in England," had its dramatic performances, and Thomas Churchyard, the Salopian poet, states that at Ashton's play a beholder " might well have seen there twentie thousand men." It is recorded that in 1568 " at Whitsuntide was a notable stage play at Shrewsbury, which lasted all the holidays, unto the which came great numbers of people, of noblemen and others, the which was praised greatly, and the chief author thereof was one Master Ashton, being the head schoolmaster of the Free school there, a godly and learned man, who took marvellous great pains therein." Thomas Ashton's first play was acted in 1561, and in the Ordinances of 1578 (of which Ashton was the chief author) the regulation was made that on every Thursday the highest form should " declaim and play one Act of a Comedy." At Sandwich Grammar School, Kent, in 1580, the statutes required " at every Christmas time, if the master do think meet, to have one comedy or tragedy of chaste matters in Latin to be played, the parts to be divided to as many scholars as may be, and to be learned at vacant times." In 1612 John Brinsley in the *Ludus Literarius* is urgent that Terence, and then the plays of the *Terentius Christianus* of Cornelius Schonæus, should be gone over by scholars, for Latin speaking; and that these plays were read widely in the English schools is indicated by the number of editions, *printed in London*, as well as abroad. The edition of 1635, printed at Cambridge, states explicitly that it is *ad usum scholarum seorsum excusa.*

Oliver Cromwell in the early sixteen hundreds entered the Huntingdon grammar school, where Dr. Thomas Beard was the headmaster. Dr. Beard had written classical comedies, and was the author of the *Theatre of God's Judgments*, a graphic account of examples of the justice of God against notorious sinners. Heath, an early biographer of Cromwell, says: " It happened (as it was then generally the custom in all great free schools) . . . that Oliver Cromwell, as a confident youth, was named to act the part of Tactus, the sense of feeling, in a play called the *Five Senses*" (or *Lingua*). These school plays were sometimes celebrations in which the town took a great interest, as, *e.g.* at Shrewsbury. In the Town Records of Southampton, in 1576, it is noticed: " Paid to Mr. Adrian [Saravia] for his charges and paiens in his tragedie, by consent xx^s." Plays were acted in the Southampton grammar school until a comparatively recent period.

Warton mentions (Vol. III, p. 309, ed. Hazlitt) a comedy written by William Hawkins, headmaster of Hadleigh grammar school in Suffolk, and acted by his scholars on Shrove Tuesday, 1626 — entitled *Apollo Shroving.* This is a genuine school play, with twenty-three characters, including such as " a young scholar," a " book-bearer," " a diligent student," a " perplexed scholar," a " young fresh scholar," a " truant," a "cockering mother," a " lazy drone," and "Captain Compliment, a teacher of gestures and fashions."

The reference in Ben Jonson's *Staple of News* (1625) (Act III, Scene 2) perhaps best brings home the close connection of the drama and education. Speaking of schoolmasters, Jonson says: " They make all their scholars play-boys! Is it not a fine sight to see all our children made interluders? Do we pay our money for this? We send them to learn their grammar and their Terence, and they learn their play-books. . . . I hope Zeal-of-the-land Busy and my gossip Rabbi Troubletruth will start up and see we have painful good ministers to keep school and catechise our youth, and not to teach 'em to speak plays and act fables of false news."

The employment of boys in the old sacred dramas, the mysteries and moralities, has already been mentioned. The boys of the chantry schools and song schools were often acolytes who served at mass, who were readily available for acting purposes. The Children of the Chapel Royal in London are traced back in the records to 1506. St. Paul's boys acted in 1528 (see E. K. Chambers, *Mediæval Drama*, Vol. II, p. 193). These boys became a recognized company of play actors under the patronage of Queen Elizabeth; so did the Children of the Choir School of St. Paul's. Professor Schelling points out that apart from these professional companies of play actors the boys of Merchant Taylors' School acted so much that the headmaster, Richard Mulcaster (1561–1586), must have been a theatrical manager; and we are told that he wrote six Latin plays.

In 1642 came the closing of the theaters in England by the Long Parliament. They were not reopened till the Restoration. The play thus by reflection from the national attitude toward the drama, fell into desuetude as a public institution in the schools, and was not *generally* resumed, when the theaters were reopened in Charles II's reign. One reason no doubt was that Latin ceased to be taught in England as a spoken language; gradually French began to take its place as an international language of travel, diplomacy, and conversation, and the colloquial Latin, for which Plautus, Terence, and original Latin dramas had been introduced, learned by heart and acted, became unnecessary. In the eighteenth century the well-known Dr. Samuel Parr, after he left Harrow, started a private school at Stanmore, near to Harrow, in 1771, and trained his pupils to perform the Greek plays of *Œdipus Tyrannus* and the *Trachiniae* of Sophocles. Dr. Richard Valpy, headmaster of Reading School (1790–1802), had four plays of Plautus acted in the school, and six plays of Shakespeare. Dr. Valpy wrote in his Preface to his Poems a defense of school plays. In the nineteenth century the two English public schools outstanding for their school plays were, of course, Westminster, which continues its cycle of the *Andria*, *Phormio*, and *Adelphi* of Terence, and the *Trinummus* of Plautus; and Bradfield College, Berkshire, which has produced a long series of Greek plays. There have been other representations, at different schools, but these two schools continue regularly to present classical plays.

Though the drama was suppressed in England in 1642, it continued unchecked abroad, and the great educationist, J. A. Comenius, is thus introduced in this connection in Morhof's

Polyhistor (written in Latin): " as in the republic comedy in the *School of the People*, so for children, schooling can be advanced by the acting of plays. Much more firmly," he goes on, " do the examples of illustrious men stick in the mind through representation by acting. Even moral and civil precepts can thus be made to appeal to youth." So Comenius advocated teaching the history of the philosophers by plays, and as an example wrote *Diogenes Cynicus* as a school play. Moreover, he turned his *Janua Linguarum* into a comic play (1657). " So we see," adds Morhof, " that schoolmasters have not merely approved school-plays, they have also enjoined them." In his preface to the Latin play *Encyclopædia Viva*, and *Janua Linguarum praxis comica*, Comenius, a strong Puritan, says, "Theologians urge their objections against us (schoolmasters) in vain. They wish to drive comedy from the state as well as the schools, because they object to the subject matter put on the stage. The answer is, to only put edifying matter into school-plays. There are seven conditions to be satisfied in a school-play. There must be movement, spontaneity, sociability, friendly emulation, distinct rules, good example, and relaxation of mind." To promote freedom and spontaneity Comenius suggests that the boys should be encouraged to throw into the Latin play any suitable *adagia* and *flosculi* which occur to them.

Even after the school drama had subsided in England, its influence survived. Thus in 1678, Samuel Shaw of Ashby-de-la-Zouch grammar school, wrote in drama form an appeal in favor of rhetoric. It is called *Words made Visible; or Rhetorica Accommodated to the Lives and Manners of Men. Represented in a country school for the entertainment and edification of the Spectators.* In 1737, John Holmes, headmaster of the Holt Grammar School, Norfolk, made history teaching interesting by employing the dramatic instincts of the boys in carrying out his pedagogic views. He wrote an account in *The History of England, being a compendium adapted to the capacities and Memories of Youth at School. Performed by the Gentlemen of the Publick Grammar School at Holt in Norfolk at their Christmas Breaking-up in 1735.*"

The twentieth century seems likely to witness a renaissance of the employment of the dramatic impulse founded on the psychology of the instinctive nature of the child. For this appears to be the right line of the development of the imitative impulse, such as we see in the first names the child applies to objects round about him, *e.g.* bow-wow, puff-puff, etc. The child's play is really drama, as may be seen in the elementary forms, *e.g.* in Bo-peep. The child's play involves the dramatic also in its instinct of constructiveness. This is manifest even in the play of conscious self-deception — which often in child's play is a mental construction to take himself in — "make believe." There is a tendency in children to turn all experiences into narrative, joined with dramatic form, *e.g.* in baby games with the toes and fingers, such as: —

Narrative with Action	This little pig went to market. This little pig stayed at home. This little pig had all the bread and butter. This had none. This cried, " Wee, wee, wee ! "

Many of the ring games and group games of children are dramatic lyrics, *e.g.* developed into games: *Round the Mulberry Bush, Here come three Jolly Sailors, I'm on the King's Ground*, etc. Froebel uses this basis of the dramatic lyric in his *Mutter- und Koselieder*, — and thus trains observation of objects and their properties by means of the dramatic element. Gradually, every department of the environment is imaginatively explored dramatically by the child, *e.g.* in "playing school," "playing house," " playing soldiers." More complicated or more distant ideas become familiar, and observation is quickened — by " playing animals," or, say, " Red Indians." The crucial element in the drama, of impersonation comes within the child's scope very early. For instance, kindergarten school children learning reading and phonetics at the same time have imagined the letters making their own appropriate sounds, personifying them, thus ;

A says, *ah, ah, ah,*
B says *bb, bb, bb,*
A and B say, *ba, ba, ba.*

With the elements of the dramatic so close and familiar to the child, in the kindergarten methods, the tendency now is to apply the dramatic method along with other methods still further in the school age. Thus, in history, the pupils impersonate the chief characters of an era; or, on a larger scale, we find municipalities in historic towns arranging for magnificent historical pageants. In geography children are led to imagine themselves taking a journey between such and such places, and to state what they would expect to see. In arithmetic examples are given which make use of suppositions implying the dramatic, such as requiring the child to imagine himself a merchant drawing up bills of parcels, or a banker in matters of interest and discounting of bills. In literature, recitation with accurate pronunciation, right intonation, and appropriate gesture has always held its place in the school. The whole art of rhetoric is founded on the idea of dramatic effect. Even in the problems of a right social and moral attitude, the dramatic form has played its part, *e.g.* in the Renaissance School of Valentine Trotzendorf (*c.* 1531), and in modern times, in Rowland Hill's School at Hazelwood, where in both schools a system of government was established by the boys themselves through their elected officers acting as courts of justice — in relation to the necessary discipline of the school.

There is, further, a return to the old position of the drama as an educative force by dramatists themselves. Mr. Bernard Shaw says: " The theatre is a place which people can only endure when they forget themselves, that is, when their attention is entirely captured, their interest thoroughly roused, their sympathies raised to the eagerest readiness, and their selfishness utterly annihilated." That the school and the drama should coöperate on terms such as these, no one would deny, and the time may come when it will be the business of the school to prepare pupils for the due enjoyment of the best things in life, in music, in painting, in architecture, and in the drama. But one element which the drama seems to present more clearly, perhaps, than any other art, cannot be dispensed with in any liberal education, viz. that of training the sympathetic imagination, so one may be able to throw himself into another person's position, and in imagination to see the "other person's" point of view. For this reason the dramatic, in some form or other, must be recognized as a necessary basis for the teaching of history, literature, and social relations. F. W.

See Dancing; Festivals, School; Play.

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DRAMATIZATION, METHOD OF. — The method of having one or more children act out a human situation or story in the presence of the class in order to vivify the subject studied.

See the separate subjects of the curriculum; also Drama and Education; Objective Methods.

DRAPER, HENRY (1837–1882). — A scientist, who graduated from New York University in 1858, and was several years a professor in that institution. He was the author of a textbook on chemistry and numerous scientific works. W. S. M.

DRAPER, JOHN WILLIAM (1811–1882). — Scientist and educator, born in England, and graduated from the University of Pennsylvania in 1836. He was for two years professor in Hampden-Sidney College, and for forty-four years (1838–1882) professor in New York University. He made important discoveries in physical science, and was the author of textbooks in chemistry, natural philosophy, and physiology, as well as of many scientific works. His *History of the Intellectual Development of Europe* was one of the best historic accounts of the achievements of science. (For portrait, see opp. p. 255.) W. S. M.

DRAWING. — History. — In 1767 Louis XV issued letters patent establishing a Free Royal School of Drawing in Paris, to promote manufactures and commerce in France. During the next hundred years other institutions of similar character were established in European countries, and the Maryland Institute was founded in the United States. Drawing was required in the public schools of Bavaria in 1811, and of Austria in 1850; but the more comprehensive and systematic instruction in art for the advancement of industry began in Great Britain with the founding of the South Kensington Museum in 1852.

Notwithstanding the efforts of William Bentley Fowle (Boston, 1820–1830), Horace Mann (Boston, 1837–1848), Rembrandt Peale (Philadelphia, 1840–1844), and Henry Barnard (Hartford, 1838–1867), drawing did not become firmly established as a required study in public schools until 1870, when the Massachusetts Legislature approved an act including drawing among the branches of learning to be taught in the public schools of the state. Between 1870 and 1907 drawing was made one of the studies required in public schools by act of legislature in twelve states, and became an approved study, promoted by official action, in thirty-one others. It was made compulsory in the public schools of Switzerland in 1874, and of France in 1878.

Theory. — The reasons for requiring drawing in the public schools are mainly the following: (1) Drawing is a language of form. By means of it the contours and colors of all visible objects, their structure and enrichment, and their interrelations in space may be defined and displayed. It is therefore the graphic recorder of scientific fact, the primary means of expression in the constructive and decorative arts, and the chief medium of the artist in making known his visions of beauty; hence the ability to understand and to make use of this language is of value to all. (2) The practice of drawing promotes (*a*) close observation, thus insuring clear mental images, the material of thought; (*b*) muscular control, or skill of hand, a prerequisite in the practice of any craft; (*c*) a knowledge of the elements of beauty, in nature and art, the basis of design, and the ground of intelligent appreciation and taste. Hence, drawing should be practiced by all. (3) The study of drawing opens to the mind the wealth of human treasure in the form of architecture, sculpture, painting, and the various handicrafts, through which man has expressed his ideals and aspirations, and leads to a keener appreciation of nature as an inspiration to art, thus vastly increasing the pleasure and the significance of life. It should therefore be free to all.

Subject Matter. — In Berlin, Germany, as early as 1844, geometrical drawing, drawing in outline from models, and freehand sketching were included in the course in drawing; but the work usually done by pupils both in Europe and in the United States, until about 1880, consisted chiefly of drawing geometric designs from dictation, copying freehand from the flat outlines of objects and historic ornament, and working problems in geometry and mechanical perspective with instruments. The courses of study in the elementary grades in the United States now generally include (1) nature drawing, (2) illustration, (3) object drawing, (4) design, and (5) construction, or the making of objects, the logical resultant of drawing and the test of its character. In secondary schools these topics are commonly classified as freehand drawing, including something of the theory of perspective and the history of art; mechanical drawing, including geometry, projection, development, and applications in the realm of architecture and mechanics; and design, including lettering, adaptation of natural forms, coloring, etc., with applications in dress and house furnishing. The European courses have been modified greatly during recent years, through the influence of American ideals.

Current Practice. — *Nature Drawing.* — From the outset pupils are encouraged to furnish their own specimens, to prune them, to pose them for the most effective view, and to draw them with colored crayon or water color, directly, without sketching first in pencil. Attention is given successively to the main lines of growth, to the branching, to the relative proportions of parts, to the effects of foreshortening as seen in leaves and flowers, to the details of structure, at the joints, in leaf scars, etc., and lastly to the total beauty of effect. At first only characteristic local color is considered, then the natural gradations of color, and lastly the play of light and shade and the resulting modifications of the local color. Emphasis is laid upon the arrangement of the drawing within its frame, and upon the proper size, color, and value of a mount for the drawing. The nature drawing throughout is related to the nature study, and furnishes material for use in design.

Illustration. — From the beginning pupils are encouraged to express freely, by means of drawing, their ideas of objects, their memories of experiences, and the images called up by spoken or written words. Memory drawings of incidents, games, sports, occupations, are followed by drawings illustrating Mother Goose, fairy stories, myths, legends, historical stories, etc. And along with this practice goes the observation and record of the sky and the earth as affected by the changes of day and night, of the weather and of the seasons. In this work the emphasis is not primarily upon accuracy of delineation, but rather upon the idea embodied, the spirit with which the story is told, the effect produced by the grouping of principal objects and accessories. The aim is free graphic expression. In the middle and upper elementary grade this passes into the applications of object drawing, and is strengthened by the study of book illustrations and pictorial art.

Object Drawing. — In the lower grades this phase of drawing is the logical outcome of free illustration. The pupils begin to give closer attention to the forms of objects, to their toys, and other things of special interest to children, including pets and the common birds and animals. They then begin to study common objects more critically, first for their proportions and contours as revealed in silhouette; then as to their apparent shapes as seen foreshortened and otherwise modified by their position in relation to the eye. The usual order of difficulties to be mastered is (*a*) the representation of solidity as seen in spherical objects, (*b*) of foreshortening as seen in hemispherical and cylindrical objects, (*c*) of convergence as seen in rectilinear objects in upright positions, (*d*) of foreshortening and convergence as seen in objects of mixed character and in combination. These are represented first in mass, by means of colored crayon and brush, and later in outline by means of the pencil, and lastly in light and shade and color by means of charcoal and water color. This work merges with illustration and the study of pictorial art in the upper grades.

Design. — Design begins in the lowest grades, with the study of color and the application of color in producing the simplest sorts of pattern, and with the proper placing of the nature drawings within margin lines. Later simple natural forms, animals, birds, insects, leaves, and flowers, are freely repeated to form borders and surface patterns for school papers, etc. The study of the principles of design, rhythm, balance, and harmony, both in form and color, begins in the intermediate grades, and continues throughout the high school; all the designs produced being either abstract (as illustrations of principles) or applied in common objects of interest to the pupils themselves. The applications involve some knowledge of such processes as weaving, embroidery, stenciling, block printing, leather working, the cutting and manipulation of sheet metal, and the adaptation of plant and other forms to given conditions. Standards of excellence in design are found in historic and modern examples of handicraft. These are studied critically in the light of the principles of design. (See DESIGN.)

Construction. — The use of such implements as the scissors, the ruler, the knife, the compasses, and the common thread-working, leather-working, wood-working, and metal-working tools is acquired by constant practice, beginning with the scissors in the lowest grades. Paper folding and cutting, the preparation of papers of the right size for school work, the making of paper furniture, booklets, envelopes, toys, illustrative objects required in language and historical stories, is followed in the intermediate and upper grades by the working out in appropriate materials of designs for all sorts of objects useful in school or home life, or in the social activities of the time, — maps and apparatus for illustrative purposes, booklets, table mats, draperies, pillows, boxes, bookracks, articles of clothing, pocketbooks, jewelry, articles useful in outdoor sports, furniture, and any other object of real value. The aim in this work is, first, practical experience in design and in the processes of construction; technical excellence is of increasing importance with every succeeding grade.

In the best schools these various lines of work are not separated by hard and fast lines, nor are they pursued arbitrarily without reference to local conditions. The season of the year, holidays and festivals, the other school studies, the dominant interests of the community, as well as of the children, are all considered in the ordering of the program. The aim is to make drawing a familiar means of expression, to enable the pupils to acquire the habit of clear visualizing, of thinking to some purpose, and of working with skill and taste; and to lead them to see that art which has enriched the lives of men in the past may enrich and glorify everything now, in every grade of school, and in every phase of the life that may follow. H. T. B.

For method, see ART IN THE SCHOOLS; ART, METHODS OF TEACHING; DESIGN.

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DRAWING, HYGIENE OF. — The essential aim in drawing from the hygienic point of view is the development of a normal habit of expressing thought, and the avoidance of injury to health from this occupation. Hence the demands of hygiene are both positive and negative, — on the one hand, training in drawing as a normal form of reaction, on the other, the avoiding of all conditions detrimental to health. On the negative side very much the same hygienic rules apply as in writing; but as drawing is a means of expression that may naturally come before writing, and as it has some peculiar aspects, the hygiene of the subject demands separate consideration. Drawing, according to Baginsky, is an especially dangerous occupaton for young children on account of the strain of the eyes likely to occur and the strong tendency to malpositions.

The drawing room should be so arranged that the light comes from the north, or if it is not used continuously, it should be so situated that there is no direct sunlight during the hours when this occupation is carried on. It may well be placed on the top story where conditions are favorable and provided with light from above. If not, the drawing table should be arranged so that the light comes from the left. There should be an abundance of light, the total window surface being equal to at least one fifth of the floor surface. Drawing should be omitted when the light is insufficient, and drawing by artificial light should be avoided; if necessary, there should be an abundance of diffused light and individual lamps at each desk. The drawing table should be constructed in such a way that pupils can work standing. The tables should be ample in size, not less than two and one half feet wide, and of different heights to accommodate pupils of different size, or else pieces of plank should be supplied which can be used by the smaller children. If the ordinary school seats and desks are used, then they should be adjustable and adapted to the heights of the pupils.

In drawing, the position of the body and the hands should be correct, long pencils should be used, the eyes should be kept at the proper distance from the table or the blackboard, as a rule about twelve to fourteen inches. The work in drawing should be broken by opportunities for looking at things at a distance. In general the well-accepted rules for the hygiene of vision should be regarded. The pupils should be warned aganst putting their fingers in their mouths when stained with colors. Care must be exercised in the use of thumb tacks, etc. Large pencils or crayons and suitable paper form the necessary materials for drawing. If blackboards are used, they should be of the best slate. Cleanliness should be especially emphasized. When colored chalk is used, care should be taken to avoid that which contains arsenic. Drawing books are no longer used by the best teachers. If used, they should not contain fine work or any work likely to be injurious to the eyes. The methods of drawing containing a network of lines should be condemned. The so-called Stuhlmann method, which consists of drawing by the aid of a network of fine lines, points, and the like was condemned many years ago by German oculists, and forbidden by the Bavarian Ministry in 1883.

Tests of vision should be made before instruction in drawing is begun. Color blindness is frequent among children, at least among boys. Jeffreys reported in 1880 on an investigation of 27,927 school children for color blindness. He found 4.20 per cent color blindness among the boys, and .066 per cent among the girls. Recent investigations by Dr. Hayes show a considerably larger percentage among girl students at Mount Holyoke College. The tests for vision should include a test for color blindness by the use of the Holmgren worsteds or Nagel card tests.

A correct posture should be emphasized. Baginsky thinks it more difficult to get a correct posture in the drawing class than in writing, because the children are so much interested in drawing. This question has been made the subject of special consideration in Germany. The teachers of drawing of the Berlin Teachers' Association, with the advice of eminent physicians, formulated the following rules some years ago: (1) The position of the upper part of the body should be natural and without strain, as free and erect as possible. The head should be inclined only a little and toward the side, and bent forward only very slightly. Both shoulders should remain at equal height. The line connecting them should be parallel to the edge of the table. The legs should be kept apart. The lower part of the legs should be kept vertical, the feet squarely on the soles. (2) The drawing surface should be placed directly in front of the medial line of the pupil. (3) The left forearm should lie on the table, and can be stretched forward, when necessary, until the lower part of the upper arm is on the surface of the table. But the forearm should not be used as a support for the upper part of the body. The left hand should tightly hold the drawing surface. (4) The right forearm should be so placed that free movement is possible. It should neither be placed firmly against the body, nor serve as a support for the upper part of the body. (5) The right hand should be supported lightly on the little finger. The hand joint should not touch the drawing surface, and the hand should never cover the line to be drawn.

Drawing, if rightly taught and of the right kind, may be begun at an early age, but it should be large and free and continued for only a short period, not more than fifteen minutes in the kindergarten and early grades, and should begin with the large curves that are easily made on account of the structure of the arm, and should consist largely of whole arm movements such as are naturally employed by the child when scribbling. Drawing should be a valuable means of healthful training: first by developing habits of cleanliness, and second by training to healthful modes of expressing thought. The importance of cleanliness should be emphasized. Great care should be taken not only to have the drawing room clean, but to keep all models, illustrations, and the like, clean, and to avoid dust from pencils, chalk, etc.

From a broader point of view, drawing as artistic expression represents a form of activity positively in the interest of health. It is one of the oldest and most universal forms of speech. Modern psychiatry emphasizes the importance to health of normal habits of expressing thought and feeling. Any form of artistic expression is a relief to intense feeling, and a prophylactic against morbid emotion. Some, like Goethe, find relief in writing; others in song; others in the different plastic arts, and so on. Dr. Scott lays stress on the function of art as a remedy for morbid fears. Frequently, he points out, the thing which at one time children are most afraid of they come in time to love. "And in my opinion," he writes, "there is not anything which will more conduce to remove those morbid fears from the constitution than allowing this emotion to run out in motor expressions, in expressions in artistic form." The positive side of the hygiene of drawing can be properly appreciated only by considering the significance of this form of motor activity as a means of artistic expression. There is a fundamental impulse in human beings to express feeling in activity. Art originates in the need for the expression of feeling. It is based on innate impulse. The significance of drawing as a means of expressing thought and feeling is clearly shown by the spontaneous drawings of children, the drawings of primitive people, and of the insane. It is a form of activity that is self-sufficient, worth while for its own sake. The product has also a social significance. An individual always considers his work in relation to other individuals. An imaginary audience is always present. This is represented, if in no other way, by the individual's critical attitude toward his own work. Thus drawing (1) is a form of normal reaction to feeling; (2) it gives the satisfaction that comes from productive activity and social expression; and (3) it develops an interest in art by making imitation possible. From the ordinary point of view of hygiene this is vague, but the psychiatrist, and the teacher who appreciates the importance of a normal life of feeling, of the satisfaction from productive activity, and of the balance that results from culture interests, cannot fail to see the positive hygienic significance of this and similar forms of artistic expression. W. H. B.

See ART IN EDUCATION; ART IN THE SCHOOLS; ART, METHODS OF TEACHING; MUSCLES, FUNDAMENTAL AND ACCESSORY; EYE, HYGIENE OF; MOTOR TRAINING.

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DRAWING ROOM IN THE SCHOOL BUILDING. — See Architecture, School.

DREAMS, AND DREAM STATES. — The psychological interest in dreams centers about the contrast of their thought progression to the procedure in the normal waking state. Dreaming thus presents the most illuminating yet familiar type of mental departure from purposive thought. The central contrast lies in the loss of control, the abeyance of the directive guidance. Yet such direction in the service of a logically intentioned end is in itself so gradual and artificial an achievement, that the quality of dreams may be regarded as the more natural, at all events the more spontaneous expression. Clearly a large part of ordinary thinking is affiliated to the more playful reverie that dominates dreaming. Dreams thus reflect, though distortedly, something of the deeper individual qualities, and in their freedom from intentional interference may furnish a clew, especially in abnormal cases, to the suppressed psychic entanglements and obstructions that surreptitiously prey upon the waking consciousness. A further contrast between dreaming and waking lies in the withdrawal from the world of outer stimulation, the larger dependence upon inner feeling and contemplation, and the introspective elaboration of the mind's more personal imaginings. In any view, the content of dreaming must present a large community of origin and interest with the reservoir from which the more alert and purposive activities draw their resources. This relation is well illustrated in the frequency with which matters of deep concern and recent interest reappear in dreams. Yet this community is quite compatible with a certain antagonism, in accordance with which concerns that are driven out from the waking activities by the very dominance of the consciously maintained interests rise to the dreaming consciousness when the rival occupations are in abeyance. The principle is aptly illustrated in the contrast of the outward and the inward directed sense-feelings. The daylight activities of the ear and the eye absorb the mind's interests and drown the murmur of the body feelings — the tensions, fatigues, position cramps and minor aches — which, with the shutting out of the objective world, rise to clearer expression and in turn furnish the emotional tone of the dream content. The nightmare of indigestion is but a drastic illustration of the principle. Concordantly with this view the sensory materials of the dream movement are classified as *presentative* and *representative*, the former referring to the sense activities that are still alert enough in the suppressed consciousness of the dream state to assert themselves, while the latter contribute the reverberations of recent experiences and the development thereof. When the carrying of a lighted candle through a room in which the sleeper lies induces a dream of fire, or the rustling of a window shade a dream of rumbling thunder, the actual sensations reach the sleeper without waking him, and form presentative elements; yet more characteristic are the direct bodily stimulations (such as the contact of a hot-water bottle inducing a dream of walking over burning lava, the tickling of a sleeper's nose resulting in a dream of wearing a mask, or the exposure to the perfume of eau-de-cologne giving rise to a dream of the Orient), which, equally presentative, yet appeal to the senses more intimately connected with the detached sensory consciousness of sleep.

Whatever the origin, whether more immediately from sensations still vibrant, or from the revived memory images, the constant characteristic of the dream action is to transform its material dramatically and often pictorially into a scene with more or less vivid setting, and therein combining with a distorted logic seemingly unrelated data from diverse sources. It is this playful reverie or dramatic romancing that characterizes the mental movement; and it is equally this that reappears in day-dreaming and in much of what is called thinking with a relaxed effort and an invitation or consent to let the thoughts wander with loose guidance. The association sequences thus emerging are individually characteristic, and the tendency to indulge in such romancing quite common, and in some temperaments dominant. The trait is clearly affiliated to the poetic tendency, to the actively imaginative mind that enables the artist to pursue his work in so far as he may succeed in setting in orderly arrangement the products of his partly directed reverie. Hence, last as first, the significance of dreams lies in their revelation of a characteristic factor of the total mentality.

The physiological as well as the psychological conditions of dreaming are closely related to the voluntary factor, the loss or retention of control, and equally related to the power to assimilate the impressions of the outer world. Being awake means to respond measurably to one's surroundings and to direct the thought movement. In the succumbing to an anæsthetic, the stage of diminishing consciousness is gauged by the waning of the power to command the muscles and to feel a stimulus; so similarly in the involuntary falling asleep, the loss of the erect posture of the head (which is a voluntary adjustment) may precede the complete insensibility to a spoken word. Since the more complete abeyance to these functions normally involves such a depth of unconsciousness as to be either dreamless or too weak to arouse a recallable dream, it follows that dreaming is related to the lighter sleep introductory to or consequent upon the deeper stages of sleep.

All states involving a sharply limited consciousness and a distinct loss of direction of the stream of thought are allied to dreaming. Abstraction, absorption in idle reverie (the situation that arouses the offer of "a penny for your thoughts"), again, the more persistent ravings of delirium, the transitory visions of hasheesh or mescal, and, quite differently, the actions of the hypnotized subject are all abnormal through sacrifice — yet different varieties of sacrifice — of the full privileges of normal mental action. A characteristic problem is that of determining how far in such states a connection with the waking consciousness persists. The fact that we remember dreams is itself an evidence of such relations; the actual persistence of the dream into waking — similarly to a projected hallucination — is well established; the playing in and out of fact and fancy in hasheesh and other intoxication is characteristic; while in hypnosis and trance-states, the two sets of ideas and actions reveal the typical subconscious relations, whereby what is seemingly suppressed or forgotten to the one consciousness may by indirect appeal be reinstated in the other.

A further characteristic of dreams is their intimate relations to the emotional life; their feeling-tone seems more directive than their associative sequence. Hence mood, bodily condition, care, worry, depression, grief, excitement, contribute intimately to the movement, which the logical powers set to pictures or to words, with such dramatic sequence as they may command. From this aspect, again, dreams become related to the personal, the private, the half-acknowledged mental life, in which in spite of awaking control, and objective interests, the desires, hopes, and secret planning for the future — all closely centered about the personal welfare — reach inarticulate expression. It is this interpretation of dreaming that has furnished the motive to the works of Freud and others, who find in the records of psychic impairment (typically in hysterical and neurasthenic cases) that the tracing of dreams to their suppressed or detached origins in unfulfilled desires and longings, is itself a means of diagnosis, and, through their transformation into an explicit statement, a cathartic and curative measure. So also the analysis of normal dreams proceeds upon their interpretation as development of the less explicit desires that contribute intimately to our personal thinking. The view is the more consistent when applied to the deeper and more sustained dreaming efforts, and thus leaves room for the incidental, pictorial, reverberatory origin of the slighter dream episodes. J. J.

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DRESS OF SCHOOL CHILDREN. — See Clothing of School Children.

DRESSMAKING. — See Household Arts.

DREW THEOLOGICAL SEMINARY, MADISON, N.J. — Founded in 1866 under the auspices of the Methodist Episcopal Church as an institution to train men for the service of the church. Graduates of reputable colleges are admitted without examination; other applicants must pass the examination. Greek is required from all. The three-year course leads to the degree of Bachelor of Divinity in the case of those who are already college graduates.

DREXEL INSTITUTE. — An educational institution opened in Philadelphia in 1892. It owes its origin to an endowment of $2,000,000 and a plant costing $1,000,000 given by Anthony J. Drexel. The aim of the institute is to offer a training to young men and women preparing for industrial and commercial life. The chief emphasis is laid upon the applied sciences, but instruction is not limited to this alone and includes a broader intellectual culture. There are six departments, giving courses in the following subjects, — architecture, science and technology, commerce and finance, domestic science and arts, physical training. No degrees are conferred by the institute. Evening classes are held and free public lectures and concerts are given. The library contains some 40,000 books, dealing mainly with the arts, sciences, and technology. The museum includes valuable collections of the ceramic arts, bronzes, ivory carvings, textiles, embroideries, and furniture. About 2500 students annually avail themselves of the courses offered by the institute.

DRILL. — The systematic endeavor to fix firmly habits or associations between stimuli and responses. These associations may connect sense stimuli with ideas or with movements, or ideas with other ideas or with movements. We may drill to establish physical or mental habits, to strike a nail properly with a hammer or to fix a name in memory. The effectiveness of drill may be said to depend upon three factors, repetition, intensity, and satisfaction. Repetition is so important and so universal a factor in drill that it is commonly regarded as constituting its meaning. To drill, it is often thought, is to go over again and again. However, as a phase of teaching, it is better to define drill from the point of view of its function, which is that of fixing associations, rather than from that of any special method of accomplishing this function, however universal it may be. The effectiveness of repetition is enormously enhanced by intensity in stimuli or responses or both. One of the most important methods of getting this intensity is by concentrating the attention. One establishes an association far more rapidly by attending carefully to what he is doing when he repeats it, than when he merely goes through this process mechanically. Again, it is evident that when the results of association are persistently unpleasant, repetition, so far from strengthening habits, tends to discourage them and to break them up. Monotonous repetition may be of little effect, but disagreeable drill may create a repugnance to the processes involved that may actually unsettle the associations. It follows that the school cannot afford to let drill be merely mechanical, or to render it markedly unpleasant.

Drill produces its most pronounced effects in its early stages. This fact has been especially emphasized by Ebbinghaus in his experiments on memory described in the monograph in *Über das Gedächtniss.* Bair in his discussion of the Practice Curve (Mon. Supplement, *Psych. Rev.*, No. 19) has brought out the same fact in regard to motor habits. Ebbinghaus tried to establish the definite mathematical law that the effect of subsequent repetitions diminishes constantly in geometrical progression. So far as experiments show it seems as though there is a limit beyond which further repetition produces no effect. However, Bryan and Harter in their "Studies on the Telegraphic Language" (*Psych. Rev.*, Vol. VI), demonstrated that after this limit seemed to have been reached, and progress had for some time been at a standstill, a new period of advance in skill might appear. We have here the celebrated *plateau* theory. No established explanation of the plateaus exists, but they are generally supposed to be periods of fixation and organization, that show no immediate result in the accuracy or rapidity of the habit, but are really a preparation for more complicated habits by which a number of stimuli are correlated and the proper complex response initiated through what is practically a single act of attention.

Practical experience with the poor results of mechanical drill has led it to be discredited and very largely abandoned by the modern school. It has been laid down as a principle that drill should never precede an intelligent comprehension of the habit of thought or action to be taught. Thus the early stages of drill are made to involve concentrated thought and interest, and so to be especially effective. When, however, this initial step in learning is not followed by further drill, it is evident that it is likely that the habit involved will prove unreliable. All teachers recognize this, but they differ in regard to the method by which the drill should be given. We may distinguish between those who believe only in incidental drill, and those who would make it fairly systematic. Incidental drill we may define as such practice in the habits that have been taught as comes with their inevitable use in the later work of the school and of life. On the other hand, systematic drill is that which is definitely planned with the idea of establishing the habit. Systematic drill may take the form of mechanical repetition or it may mean a review of the habits in different concrete applications. The latter method combines the advantages of persistent practice with those of concentration and interest. It is thus the most effective kind of drill. It is, however, not easy to insure that whatever the school wishes to teach can be made the subject of such treatment. It follows that as yet the teachers have not found it possible to dispense with systematic mechanical drill, although its disappearance may be regarded as an ideal toward which the school should strive. It is interesting to note that the *Springfield Tests* (*q.v.*) revealed that in the old-fashioned school, where mechanical drill was more in vogue, children did not learn to spell, to write, to solve arithmetic problems or to give the locations of geographical places any better, or even so well as they do to-day when incidental drill is so largely relied upon. E. N. H.

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DRILL, FIRE. — See Fire, Protection Against.

DRILL LESSONS. — See Lessons, Types of.

DRINGENBERG, LUDWIG. — A schoolmaster of the fifteenth century. Born about 1430 in a town in Westphalia from which he took his name, he was sent to the school at Deventer which then stood under the wholesome influences of the Brethren of the Common Life (*q.v.*). After studying at Heidelberg he was called to take charge of the Latin school at Schlettstadt, a flourishing Alsatian town, in 1450. At this school his influence was directed to breaking down the old scholastic traditions and to introducing the culture and piety of the Brethren of the Common Life. In place of the old lifeless study of grammar he introduced the reading of the Latin classics. His services were of importance in helping to bridge over the period between the scholastic and humanistic influences in the schools. Schlettstadt itself became under the influence of Dringenberg and his pupils and successors one of the centers of the humanistic movement. He died in 1490.

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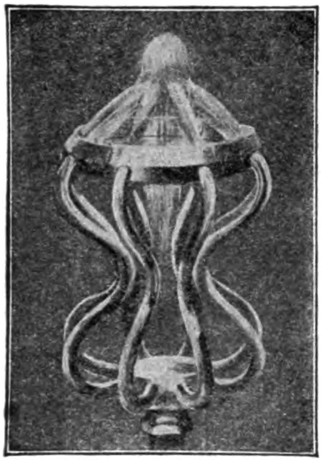
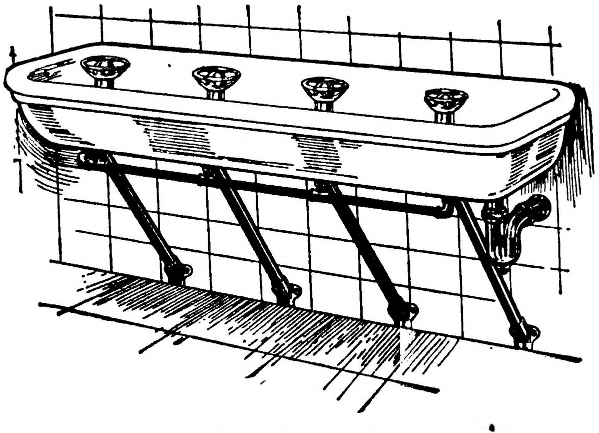
DRINKING FOUNTAINS. — Where pure water under pressure is furnished to schoolhouses, there is no longer any excuse for drinking cups, and all the trouble, loathing, and possible contagion incident to common drinking vessels. Drinking fountains, when properly made, save time, prevent the careless use of water in or out of buildings, and best of all insure perfect cleanliness. The principle involved in the construction of all forms of drinking fountains consists in furnishing an opportunity for a child to drink from a stream of water bubbling up directly from the supply pipe and at the same time insuring that the mouth of the drinker does not come in contact with any part of the fixtures or that the water not swallowed cannot fall back to pollute the rising stream of pure water. A fountain must also meet certain other requirements. The stream must be steady, must be large enough to supply sufficient water for ordinarily rapid drinking, must mount at least two inches above any part of the bubbling cup, must offer as little chance as possible for mischievous children to " squirt " each other, and must be as economical of water as legitimate demands will permit. The material of which they are made should be such that they can be easily kept clean and perfectly sanitary. A good quality of white well-glazed porcelain is perhaps the best material used. Metal or marble is hard to keep clean or free from rusts or stains. The nozzle of the service pipe should be nickled or in some better way rendered completely rustproof. All exposed parts should be strong, and provision should be made to prevent clogging of the catch basin, so that the unused water will disappear at once. Children take a peculiar delight in dabbling in water, and this universal and almost resistless craving will assert itself and cause trouble unless the construction of the fountain is such as to make this practically impossible. The cuts here reproduced represent two forms of fountains which, when properly set, are thoroughly sanitary. Doubtless there are others equally perfect.



Single fountains can be distributed throughout a school building as demands dictate; but as far as possible they should not obstruct the halls, and yet should be visible from the halls. Special alcoves or niches should be arranged for them. In addition to those on the main floors, there should be " batteries " of them in the basement or in some inclosed place near the playground. There is always a rush for a drink after play, and many pupils must be supplied quickly. The accompanying cut shows a provision to supply this demand. The exorbitant price which prevails for such appliances has prevented their almost universal use where pure running water is to be had. It is, however, entirely possible for any plumber to arrange a less expensive series of fountains for a playground or a basement. A series of short pieces of water pipes set at right angles to a main feed pipe about thirty inches apart and extending over a common waste water trough can be made into fairly satisfactory fountains at very little expense. One of the simplest methods of preparing these is to cover them with a close-fitting nickled covering close the outer end with a cap and drill a hole on the upper side a few inches from the cap. By the use of a valve which can be adjusted to suit the pressure, and one to turn the water on and off as needed, a series of jets can be made to bubble up so that almost perfect sanitary conditions may prevail. Care and a bit of experimenting will be necessary in order to adjust the size of the holes, and the valves to the pressure of the water. Of course this arrangement will not be so neat, neither will it be so completely satisfactory as the one shown in the illustration, but many so made have proved quite satisfactory. Every modern school should be supplied with drinking fountains for the sake both of decency and safety. F. B. D.



DRISLER, HENRY (1818–1897). — Head of the department of Greek in Columbia University for many years, and the editor of Harper's classical series and several Greek lexicons, was graduated at Columbia in 1839. For four years he was instructor in the grammar school connected with Columbia, and from 1843 to 1894 he was professor of Greek and Latin at Columbia. W. S. M.

DROPSIE COLLEGE, PHILADELPHIA, PA. — An institution opened in 1909 as the result of a legacy left by Moses A. Dropsie for the promotion of and instruction in the Hebrew and cognate languages and their respective literatures and in the Rabbinical learning and literature. Candidates who have received the degree of Bachelor of Arts from a college or university of good standing are admitted to the courses leading to the degree of Doctor of Philosophy. There is a faculty of five members.

DRUGGIST, EDUCATION OF. — See PHARMACEUTICAL EDUCATION

DRUIDS, SCHOOLS OF THE. — Little is known of these institutions and all the evidence on the subject rests on a statement found in Cæsar, *Gallic War*, Vol. VI, pp. 13, 14. In describing the Druids Cæsar says, "a great number of youths resort to them for instruction." The curriculum consisted in memorizing a large number of verses, and "they also discuss and teach the students about the stars and their movement, about the size of the universe, about natural phenomena, and the power and authority of the gods." Instruction was purely oral, although writing was known and used. The course, which lasted twenty years, seems to have been a period of apprenticeship for the attainment of the druidical position. Cæsar points out that exemption from military service, taxation, and other burdens make the position so attractive. Still following the same authority, the schools flourished in Britain and were visited by students from Gaul. Of the numerous verses to which Cæsar refers three survive in the writings of Diogenes Laertius, Procemium, five, "Revere the gods, — do no evil, — practice bravery."

Cæsar's observations on folkways and customs of the people with whom he came in contact are usually so sound, that there is every reason to believe his account of the schools of the Druids, with this reservation, however, that he is the only authority.

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DRURY COLLEGE, SPRINGFIELD, MO. — A nonsectarian, coeducational institution, organized in 1873. The institution labored under great financial difficulties until 1892, when a movement was inaugurated to place it upon a sound financial basis. A gift of $50,000 from Dr. D. R. Pearsons of Chicago, one of an equal amount from the General Education Board, and a third gift of the same size from Mr. Andrew Carnegie, enabled the endowment to be greatly enlarged, new buildings to be added to the equipment and the curriculum to be strengthened. The Congregational College and Education Society has always lent its support to Drury College.. The board is a self-perpetuating body of 21 members, including the president *ex officio;* one group of five trustees is elected each year to serve five years. In 1908 Drury College was accepted by the Carnegie Foundation for the Advancement of Teaching (*q.v.*). The institution maintains a college of arts, admission to which is by examination or certificate from an approved high school; a conservatory of music; an art department; a military department, an academy, and a night school. Grounds, buildings, and equipment are valued (1909) at $141,232.89. The total productive endowment is $240,000; the total annual income is $30,701.88. There is an outstanding debt of $43,549.57. The average salary of a professor is $2100. There are twenty-five members on the instructing staff. The student enrollment in 1910-1911 numbered 450. C. G.

DUALISM. — Philosophic systems which make a hard and fast antithesis between terms which are related to each other in experience are known as dualisms. The philosophic dualisms that have chiefly influenced education are those between spirit and matter, mind and body, logic and psychology. The first has shown itself in the tendency to set humanistic studies dealing with mental products, over against the naturalistic dealing with physical nature. The dualism between mind and body has manifested its influence at some periods in contempt for physical health and training, and in ascetic aspects characterizing scholarship; and at other times in complete separation of methods of physical and mental culture and in contempt for all subjects in education that involved manual activity. The dualism of logic and psychology has reflected itself in treating subject matter and method as independent divisions of education, subject matter being arranged on strictly logical principles, while method is supposed to deal merely with psychological devices by which the approach of individuals to this ready-made subject matter may be facilitated. For educational purposes, the opposite of dualism is not necessarily monism, but a philosophy which regards the distinction of antithetical terms (like those just mentioned) as relative and working, not fixed and absolute, so that they are capable of coming together in functional unity. J. D.

DUBLIN UNIVERSITY, TRINITY COLLEGE, DUBLIN. — The oldest institution giving university education in Ireland.

Attempts to found a university were made as early as 1311, when a Papal Bull, sanctioning the project, was issued. The scheme, however, though twice revived at that period, fell through. The project was again renewed about 1550, but without success. In 1590 a petition was made to the Mayor and Corporation to found an institution to provide a higher education for the natives in order to prevent the constant drain to foreign universities. In view of its subsequent history, it is interesting to note that in its beginnings, the Dublin University received the support of Protestants and Catholics alike, as also of English residents and natives. In 1593 Trinity College was opened. James I gave his patronage as well as some property, and the privilege of sending two members to Parliament. Through the provost and the other members of the faculty an intimate connection was maintained with Oxford and Cambridge. A result of this was an attempt to realize the English conception of a university as a collection of colleges. The attempt was, however, unsuccessful. No religious tests were at first imposed, but a change of policy was introduced when Archbishop Laud became Chancellor, and since that time, with brief intermissions, the university has remained a stronghold of the Established Church, although degrees are given since 1794 without religious tests. The university suffered largely through the unsettled state of Ireland and material progress was not assured until the eighteenth century. The early curriculum included classics, theology, philosophy, and mathematics. In the last field Dublin University early established a great reputation. But the most rapid development took place in the last century. Degrees in classics (1816), mental and moral science (1834), theology (1833), natural science (1831), law, and history (1856), were established in many cases before they existed at Oxford or Cambridge. A medical school had been in existence since the seventeenth century. In 1842 a chair in civil engineering was established and the degree in that subject was introduced in 1872. For the professional schools the entrance requirements are a degree in arts. In addition to the granting of degrees to residents of Trinity College, degrees are also given to nonresidents on passing the necessary examinations, — a practice which contributed largely to the promotion of higher education in Ireland. With Dublin University is affiliated Magee College, Londonderry. All classes, examinations, and degrees in arts, medicine and law are open to women. Formerly Dublin degrees were granted to women who held certificates from Oxford or Cambridge, but this practice has recently been abolished. Trinity College possesses a remarkable library which ranks as one of the most important in the world. Its history is noteworthy as having been twice aided by subscriptions from the English army engaged in Ireland in 1601 and 1661. Among the valuable collections are Biblical and Oriental Mss., *editiones principes*, including Petrarch's *Sonnets* (1470) and Dante's *Divine Comedy* (1472), and a large number of Irish illuminated books dating back to the eighth and ninth centuries, including some of the masterpieces of the early art of illumination and copying. Of a large number it is only necessary to mention the *Book of Kells*, "the most beautiful book in the world." In English and Irish history the alumni of Trinity College, including Burke, Swift, and Moore, have played an important part in all walks of life.

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DU CANGE, CHARLES DU FRESNE, SIEUR. — Born at Amiens in 1610, died in 1688. He was educated at the Jesuit college in Amiens, studied law at Orleans and afterwards practiced in Paris. Du Cange was profoundly devoted to the study of medieval history, and the great monument to his name is his three-volume glossary of medieval Latin, and his two-volume glossary of medieval Greek. The former work appeared in 1678, the latter in the year of his death. Du Cange wrote also on language, history, geography, heraldry, law, numismatics, epigraphy, and Greek and Latin paleography. He discussed in detail jousts, the round table, the quintain, coats of arms, the origin of the colors and metals employed in heraldry, and the coinage of the Emperors of Constantinople. His greatest historical work was done in the field of Byzantine history. Du Cange was a type of the best seventeenth century school of thoroughly scientific workers in the field of literature and history. P. R. C.

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DUELING IN THE UNIVERSITIES. — The code of honor which prescribes dueling as the only mode of atoning for an insult has been retained in the German universities as a survival of the Middle Ages. The duel or *Mensur* is encouraged by the various student associations, although there has been a tendency recently for the formation of nondueling associations. The universities officially set their faces against the practice and the scene of the encounters is usually outside the jurisdiction of the authorities. The causes for this form of reparation are frequently very slight and trifling, often giving the impression that the so-called insult is nothing more than a pretext to secure a duel. The *Mensur* in most cases is fought with the *Schläger*, a long, whiplike sword with a basket hilt. The aim is to draw blood or to extend the contest over fifteen minutes. The eyes, neck, chest, and right arm are all fully protected; the eyes with a steel spectacle frame, and the neck with a paddled leather jerkin. A medical man is always in attendance. In some forms of dueling the seconds stand by their principals to ward off foul or dangerous blows. Saber and pistol duels are also known, but are rare. There is some danger that the practice of dueling may, in many cases, lead to bullying on the part of the skilled swordsman, and such cases are not unknown. On the other hand, the *Mensur* calls for a certain kind of courage, a quick eye, a ready command of the wrist and body; while, as Paulsen remarks, " the rapier puts all upon an equal footing." In addition to the duel as a form of securing satisfaction for an insult, there is the *Bestimmungsmensur* (regular match or bout) among members of the various societies, in which a little of the acrimony of the duel is absent. But whether any form of sport which goes to the extent of bloodletting, and, as frequently happens in the case of the *Mensur*, permanent disfigurement should be encouraged, it is difficult to say. The students of each nation have their own traditions, and their old-established forms of sport, and it is not an easy matter to suggest that the German student ought to play football, or the American ought to reform his particular sports. The opposition to dueling is increasing in Germany, but to the popular mind the typical German student is still the man with a scar. There is no doubt that the introduction of athletics, under royal patronage, will to a large extent leave dueling in the hands of the few bolder but more reckless spirits.

See Student Life.

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DUER, WILLIAM ALEXANDER (1780–1858). — Jurist and educator; was the fifth president of Columbia College (1829–1842). He was one of the promoters of the American Lyceum Association (*q.v.*), and for several terms its president. W. S. M.

DUGARD, WILLIAM (1606–1662). — English schoolmaster, educated at the Royal Grammar School, Worcester, and entered Sidney Sussex College, Cambridge, 1622. Dugard took his B.A. in 1626, and became usher of Oundle School, and in 1630 was promoted to the headmastership of Stamford School. In 1637 he became headmaster of Colchester grammar school, where he raised the numbers from nine to sixty-nine. In 1642–1643 he resigned, after a quarrel. In 1644 he succeeded to the chief mastership of Merchant Taylors' School, London. In 1648 he was made Examiner of the Company's schools in the country, with a fee of £20. Soon after he set up a private printing press, and busied himself in politics. It seems that Dugard was one of the printers who took part in the publication of the famous Εἰκών Βασιλική. In 1650 Dugard was committed, by order of the Council, to Newgate Prison, for printing pamphlets against the Parliament. He was set at liberty, it is said, by the interposition of John Milton, but a new headmaster of Merchant Taylors' School had been appointed, and Dugard opened a private school. He made his peace with the state, and printed Milton's answer to Salmasius. Within five months from release from prison, Dugard was reinstated in the headmastership of Merchant Taylors' School. His boundless energy again led him into trouble. In 1658 he printed the *Racovian Catechism.* The copies were taken and publicly burnt. In 1660 he was dismissed on the ground that by statute only 250 boys were to be admitted to the school, and he had increased the numbers beyond the limit, and acted irregularly in certain proportions of free and paying boys. In July, 1661, Dugard again opened a private school, and soon had 193 pupils. He died in 1662.

Dugard was the leading Puritan schoolmaster. He wrote school textbooks of some merit. In regard to Dugard's *Elementa Rhetorices* (3d ed., 1665) and his *Rudimenta Graecae Linguae* (*c.* 1656), Charles Hoole (*New Discovery of Old Art of Teaching School,* 1660) speaks in commendation, and mentions his *Lexicon Testamenti Alphabeticum.* Dugard also produced editions of Lucian and the Greek Manual of Seidelius for school use. Of his books, however, none is now so interesting as his translation in 1656 of Comenius's *Janua Linguarum,* decidedly the best of the English versions of Comenius's *Janua.* F. W.

DUISBURG, THE UNIVERSITY OF, RHINE PROVINCE, PRUSSIA. — Established under the auspices of the Reformed Church in 1655. It never attained any prominence, and, like a number of other German universities, came to an end (1818) during the period of reconstruction after the war of liberation.

DULWICH COLLEGE, LONDON. — See College; Colleges, English; Grammar Schools; Public Schools.

DUNCE. — A term commonly used of a pupil of poor abilities who is dull and slow at his books. The word, however, has very interesting antecedents which link it with the scholastic movement. The many followers of Duns Scotus (*q.v.*) early acquired the reputation for quibbling, hairsplitting, and sophistries. By their contemporaries they were called indifferently Scotists or Dunses. Their opposition to the humanistic movement helped to give the term a new connotation, and a Duns or Dunse came to mean a dull person, a blockhead, an unscholarly person who could not recognize the value of the new learning. The term was already in use in this sense at the end of the sixteenth century, and is thus explained by Cotgrave (*q.v.*). The transference of the word to the schoolroom was a very simple matter. With the use of the term came the dunce's cap of conical shape and variously ornamented with a capital D or donkey's ears. A new pedagogy based on an improved psychology is gradually driving this appellation, with many others, out of the school.

The term "duns" or "dunce" was also used to refer to copies of Duns Scotus and to any similar kind of text in theology or logic. Compare the use of the term *donat*, where the personal name came to be employed for the man's work. See Murray's *Oxford Dictionary*, *s.v.* "Dunce."

See Rewards and Punishments.

DUNDEE, UNIVERSITY COLLEGE OF. — A coeducational institution, since 1897 a constituent college of the University of St. Andrews (*q.v.*); was founded and endowed in 1881 by Miss Mary Ann Baxter of Balgavies and John Boyd Baxter, LL.D., Dundee, who conjointly donated £50,000 for the purchase and equipping of buildings, and £100,000 as a permanent endowment fund for the provision of teaching. The college was formally opened in 1883 under the principalship of William Peterson. The deed of endowment directs that the college shall be for the promoting of the education of persons of both sexes, and for the study of science, literature, and the fine arts; and it is further stipulated that "no student, teacher, or other person shall be required to make declaration as to religious beliefs, and nothing shall be introduced in the manner or mode of instruction in reference to any religious or theological subject which can reasonably be considered offensive to the conscience." As a consequence of this condition, the work of the college has been confined to the teaching of arts, science, medicine, and law. At the present time, courses of study are provided leading to graduation in arts, science, and medicine. In addition to these courses, evening classes are conducted, intended for those who, while unable to enter on a regular course of training during the day, are yet desirous of gaining a systematic knowledge of the subjects they elect to study. A. D.

DUNS SCOTUS, JOHN. — "The Subtle Doctor." One of the half dozen most celebrated scholastic teachers; "the acutest and deepest thinker of the Christian Middle Ages," says Windelband; theologian, philosopher, author, and founder of the school of Scotists; not to be confused with the founder of scholasticism, Scotus Eriugena (*q.v.*). The authorities are not agreed as to his birthplace or the main dates in his life, except that he died young in Cologne, Nov. 8, 1308. He was born probably between 1265 and 1275, either in Dun, Ireland, or in Duns, Scotland, or in Dunston, England. All have claimed him; the Irish have spread his fame most. He came of noble blood; at an early age became a Franciscan friar; studied, especially mathematics, at Merton College, Oxford, learning more from books than from his teacher; became *Magister* of all the sciences when still young; in 1301 was made professor of theology in Oxford; attracted throngs of students as a lecturer; wrote on the works of Aristotle (*q.v.*) and on the *Sentences* of Peter Lombard (*q.v.*), his comments on the first part of the *Sentences* receiving particular praise from later theologians; in 1304 went to Paris as professor of theology, becoming thus twice a doctor; taught here with great distinction, winning his title of "the Subtle Doctor" through his triumphant defense, against two hundred objections, of the Immaculate Conception of the Blessed Virgin; continued his writing; was made regent of the theological school; in 1308 was sent by the Franciscan general to Cologne to engage in a controversy with the Beghards and to assist in founding a university; was received there by the nobles and magistrates with greatest ceremony, but was taken off shortly afterward by apoplexy.

Duns Scotus made at least three important contributions to the thought of his time: first, he separated philosophy and theology; second, he made theology rather ecclesiastical than biblical in character; third, he made philosophy voluntaristic rather than intellectualistic in character. He separated philosophy and theology by making the one earthly, the other heavenly; the one interested in proofs, the other in doctrines; the one intellectual, the other practical, — the two were so divorced that what was philosophically true might be theologically false. The authority of Scripture depends on the authority of the Church; thus he could defend the Immaculate Conception of the Virgin, and thus his theology was ecclesiastical. As to his voluntarism, he holds that the individual alone truly exists; that the human will is free; that it is not bound by the reason; that it is free to choose or not; that it is free to choose between two possibilities; that attention increases the distinctness and intensity of ideas given in the course of nature; that we can will to think; that not even the will of God is bound by His wisdom; that the Creation might have been different; that God does not choose a thing because it is good, but it is good because He chooses it; that by commanding murder God could make it no crime; that man coöperates with God in his own salvation, Christ being the door through which man himself must walk. On all these, and many other similar matters, he and his Franciscan followers, the Scotists, were opposed by St. Thomas Aquinas (*q.v.*), and his Dominican followers, the Thomists, and on account of these views he was not canonized by the Roman Catholic Church. As Erdmann says, " In spite of the fact, therefore, that Duns is the truest son of the Romish church, he has brought scholastic philosophy to a point where it is obliged to announce to Rome the termination of its period of service." Unfortunately Scotus is still without an exhaustive monograph. H. H. H.

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DUNSTER, HENRY (1609-1659). — The first president of Harvard College; was born at Bury, England, on Nov. 26, 1609. He was graduated from Magdalene College, Cambridge, in 1630. In 1640 he was selected president of Harvard College, succeeding Nathaniel Eaton, who had been master of the new institution for two years. In 1654, because he had advanced doubts as to the validity of the doctrine of infant baptism, he was required to resign the presidency of the college. He died at Scituate, Mass., on Feb. 27, 1659. W. S. M.

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DUNTON, LARKIN (1828-1899). — Educator, graduated from Waterville College (now Colby University) in 1855. For the next seventeen years he was principal of secondary schools in Maine and Massachusetts. He was principal of the Boston Normal School from 1872 to 1899. Author of a spelling book, a series of geographical readers, and numerous essays on education. W. S. M

DURANT, HENRY (1803-1875). — The moving spirit in the organization of the University of California, was graduated from Yale in 1827. For several years he was principal of the Academy at Byfield, Mass., and in 1853 he organized an academy at Oakland, Cal., which two years later became the College of California, and in 1868 the University of California, of which he was president until 1871. W. S. M.

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DURATION. — That phase of experience whereby the subject recognizes the succession of experiences. When we are conscious of such a succession, that is, of a transition in time, we have an experience of duration. The process by which we recognize duration has been much discussed in psychological literature. To one group of writers, such as James, duration seems to be a fundamental characteristic of all experience. James puts duration on a par with the intensity and quality as an essential characteristic of all mental experiences. Other writers make an effort to explain the recognition of duration as dependent upon the comparisons which arise through fluctuations in experience. Thus when the transition is made from a given tone to a second tone, there is not only a change in quality, but a shock of transition. This shock develops in a type of recognition which is related to comparison between the two tones. The special forms of perception of duration are of interest because they are intimately related to the contrasts which emphasize transition. Thus in English poetry the duration of a foot is largely affected by the degree of emphasis. A very intense expression may, in some cases, be of equal value with an unaccented expression of much longer duration. If a contrast is so great as to surprise the individual and attract his attention to the content of experience, the duration phase of the experience may be entirely lost sight of. Those psychological writers who do not agree with the position of James that duration is a fundamental characteristic of mental experience seek to explain the perception of duration through a study of contrasts and moments of transition. In some cases the sensations which accompany these experiences of transition have been treated as of great importance in determining the perception of duration. C. H. J.

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DURBIN, JOHN PRICE (1800-1876). — Educator, attended Miami University and the Cincinnati College. He held professorships at Augusta College, Ky., and Wesleyan University, and was president of Dickinson College from 1834 to 1845. He published several papers on observations in European schools. W. S. M.

DURHAM, UNIVERSITY OF. — An educational institution which is doing important work in providing university studies in the northeast of England. The present foundation was established in 1831 by the Bishop, Dean, and Chapter of Durham Cathedral. Durham County had, however, through its cathedral and monastic foundations, had an intimate connection with the provision of university education in the fourteenth and fifteenth centuries, since they maintained a cell at Oxford for monks of Durham, to pursue university studies. This early foundation at Oxford was, for a time, known as Durham College. It came to an end in 1540, when the property was confiscated, and in 1555-1556 Trinity College was built on its site. Henry VIII planned a college at Durham, but nothing was done until 1657, when Cromwell interested himself in the matter and granted the cathedral property for the purposes of a college, but although letters patent were given to this institution, it did not receive university powers. It was vacated at the Restoration. Nothing more was done until 1831, when the Bishop, Dean, and Chapter of Durham interested themselves in projecting an academical institution or college, or university. The charter for a University of Durham was received in 1837, and degrees were then for the first time conferred. Durham Castle was appropriated to the use of the university. The subjects of instruction were divinity, Greek and Latin, mathematics, and natural philosophy. The university remained under the dual control of the Dean and Chapter on the one side, and the Warden and Senate on the other, although attempts have been made, unsuccessfully, to remove this anomaly. Women were admitted in 1895. The residence for an arts degree was reduced in 1865 from three to two years. The university was the first to offer a course in civil engineering, in 1837; but there did not seem to be a demand for this, and it was dropped. The theological course, which, at present, forms an important part of the work of the university, was established before that at Oxford or Cambridge. In 1870 the college of medicine at Newcastle-on-Tyne became a constituent part of the university, which was empowered to grant recognized degrees in medicine. In 1871 the college of science, now Armstrong College, also at Newcastle, was brought into close connection with the university; which allowed a large part of the work of the college to count toward degrees and diplomas. The college of science, however, developed on its own lines, and now offers courses in the humanities and education. With Durham University are affiliated Codrington College, Barbados, since 1875, and Fourah Bay College, Sierra Leone, since 1876. In 1895 the university undertook the examination of secondary schools. University College and Bishop Hatfield's Hall are maintained as residence halls for men, and Abbey House as a hostel for women.

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DURUY, VICTOR (1811-1894). — French historian and educator. He studied at the *École Normale Supérieure* (1830-1833), and subsequently was professor of history at the Lycée Henri IV for a quarter of a century, academy inspector, general inspector of public instruction, and finally professor of history at the École Polytechnique. He was Minister of Public Instruction under Napoleon III (1863-1869), and instituted important reforms in the system of public secondary education. In the boys' schools, the old narrow humanistic course partially gave place to a broader scientific training, with more emphasis upon history and modern languages. Public secondary education for girls is largely due to his initiative, for his recommendations were directly responsible for the establishment of the secondary courses for girls, which were subsequently evolved into the present lycées and collèges. He occupied a seat in the Senate (1869-1870), retiring to private life after the events of that year. He was author of *Histoire de France* (2 vols., 1852); *Histoire des Romains* (7 vols., 1879-1885); *Histoire des Grecs* (3 vols., 1886-1891); as well as of several school histories.

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DURY, JOHN (1596-1680). — Protestant divine who devoted his life to an attempt to secure unity among the Protestants of Europe. Among his numerous writings are several of educational interest. In a *Motion tending to the Public Good* he dealt with schemes of education. In an *Exercitatio of Schooling*, which is extant in manuscript only (Sloane Mss., British Museum 649), he advocated a scheme of public education for all classes of society — schools common to all to give a knowledge of "things"; schools for the teaching of ancient languages as a preparation for the professions; schools for teaching of modern subjects as advocated in the academies (*q.v.*) of the time to prepare nobles and gentlemen for "public charges in peace and war." But his most important work is the *Reformed School*, which he probably wrote under the inspiration of his friend Hartlib (*q.v.*) in 1650. While this work contains no original matter, it is significant as a reaction of an educated man to the educational ideas of his time. In the *Reformed School* there are echoes from Bacon, Comenius, and Milton, with some contribution from the publicists of the day. Dury is the spokesman for a religious teaching association which Hartlib wished to form in England on the model of those in France. From the *Reformed School* something of the aims of the association is learned. Godliness, bodily health, manners, and "last and least part of true education, Proficiency in learning," are to be the ideals.

Dury is not behind contemporary writers in attacking the learning of words, and is a strong advocate of realism (*q.v.*); the "Tongues," he says, "without their subordination unto arts and sciences are worth nothing towards the advancement of our happiness." Sense, tradition, and reason are the three sources of knowledge, and everything must come through the senses. As there is a gradation of the sources of knowledge, so there is a hierarchy of faculties. Dury strongly advocates that consideration should be paid to the "natural capacities" of children, and that teachers should assume part of the toilsomeness of their business in order to relieve the children. Formal schooling is not to begin until eight or nine years of age, although Dury suggests a "Nursery" which corresponds to the "School of Infancy" of Comenius. In *A Supplement to the Reformed School,* there is an excellent presentation of the relations to each other and the respective functions of the school and college, and of the qualifications of students and professors, "none should be admitted into anie Colleges but such as will join with others, to elaborate some Profitable Tasks, for the Advancement and facilitating of superstructure in things already by some discovered, but not made common unto all: And that none should be made Publick Professors in Universities, but such as have not onely a Publick aim, but som approved Abilities, to supply som defects and to Elaborate som desiderata of usefull knowledge, or to direct such as are studious. . . ."

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DUST. — See AIR OF THE SCHOOLROOM; ARCHITECTURE, SCHOOL; CLEANLINESS OF THE SCHOOLROOM.

DWIGHT, BENJAMIN WOODBRIDGE (1816–1889). — Schoolmaster; graduated from Hamilton College in 1835, and for a few years an instructor in that institution. He founded the Dwight High School in Brooklyn, and was twelve years its principal. Author of *Higher Christian Education* (1859) and *Higher Culture of Women* (1874). W. S. M.

DWIGHT, EDMUND (1780–1849.) — One of the founders of the modern school system in association with Horace Mann (*q.v.*); was graduated at Yale in 1799, after which he traveled and studied in Europe for two years. He was keenly impressed with German and Swiss institutions for the training of teachers, and when a member of the first State Board of Education in Massachusetts he made the donation that established the first normal schools in that state at Framingham and Westfield in 1839. He was one of Horace Mann's most valued supporters during the formative period of the reorganized Massachusetts school system. W. S. M.

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DWIGHT, FRANCIS (1808–1845.) — Educational journalist, active in various popular educational movements; was graduated from Harvard College in 1827. He was one of the promoters of the Lyceum movement (*q.v.*), and was editor of the *District School Journal* from 1840 to 1845. W. S. M.

DWIGHT, SERENO EDWARDS (1786–1830). — The third president of Hamilton College; was graduated from Yale College in 1803. For three years he was a teacher at Litchfield, for four years a tutor at Yale, and for three years master of the New Haven Gymnasium. He was president of Hamilton College from 1833 to 1835. W. S. M.

See HAMILTON COLLEGE.

DWIGHT, TIMOTHY (1752–1817). — The ninth president of Yale College, was born at Northampton, Mass., on May 14, 1752, and was graduated at Yale in 1769. He was for four years principal of the Hopkins Grammar School, six years a tutor at Yale, and several years principal of the academy at Greenfield, Conn. He was president of Yale from 1795 to 1817. Author of several books on religion and travel. He died at New Haven Jan. 11, 1817. W. S. M.

See YALE UNIVERSITY.

DYNAMIC. — Relating to force or energy in active operation. The term was first used technically in physics to denote the doctrine of force causing motion, as distinct from static, referring to matter in a condition of rest. The distinctions were applied to sociology by Comte, "static" to designate the structure of society, "dynamic," the laws of social change. In psychology, "dynamic" has been used as an equivalent of functional psychology (*q.v.*) as distinct from the analytic — or structural — psychology of elements. In educational literature, the term is commonly used to denote emphasis upon the active and motor processes, in distinction from attitudes of passivity and receptivity and docile absorption. J. D.

See ACTIVITY.

DYNAMOGENIC METHOD. — In his volume on *Mental Development in the Child and Race,* Professor Baldwin describes a number of experiments in which he studied the perceptual processes in young children by allowing them to reach for objects which they preferred. Thus he attempted to discover which colors children recognize and prefer by offering them a variety of colored objects and counting the number of times they reached for the one or for the other color. In view of the fact that this method employs activities or expressions for the purpose of studying the mental processes of the individual, the emphasis is laid upon the dynamic phase of the process; hence the name employed in describing the method. The same type of method has been described by other experimenters in psychology as the expression method. This is contrasted with the various impressions of psychological experimentation.

See EXPRESSION METHODS.

EACHARD, JOHN (1636?-1697). — An English divine, master of Catharine Hall, Cambridge, from 1675, and Vice-Chancellor of the University in 1679 and 1695. He showed great energy in securing donations for the rebuilding of his college. In his own time he had a great reputation as a wit and satirist, to which Swift bears testimony. From the standpoint of education his most important work is *The Grounds and Occasions of the Contempt of the Clergy and Religion enquired into. In a Letter to R. L.* (London, 1670), in which he subjects the education in the schools of his day to a scathing criticism. He asks, for example, " Whether it be unavoidably necessary to keep lads to sixteen and seventeen years of age in pure slavery to a few Latin or Greek words? . . . Suppose some part of the time were allotted them for the reading of some innocent English authors." He recommends the study of arithmetic, geometry, " and such alluring parts of learning." He objects to the sugar-coating of lessons by devices such as those recommended by Comenius, to whom he refers; the fine pictures and games "by no means is such a lasting temptation as the propounding of that which in itself is pleasant and alluring." He points out what poor material is sent to the universities, not only badly prepared intellectually, but also financially, to learn " a little logic, a little ethics and, God knows, a very little of everything." He proposed that English exercises should be imposed upon lads in the schools, since English and not Latin is the language spoken generally. From this point Eachard goes on to indicate the defects of the clergy, especially in rural parishes, due to bad preparation and poverty. This essay was used by Macaulay in his *History of England* in the account of the clergy of the Restoration period.

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Dictionary of National Biography.

EAR. — The ear is one of the highest organs of sense. It is protected by the hardest bone in the body, namely the petrous bone. Sound is carried to the sensory cells which are imbedded deep in the bone, by a complex mechanism of transmitting and receiving organs. In addition to sensory cells which receive sound stimulation, the ear also contains a system of canals known as the semicircular canals which constitute an organ of equilibration. This organ of equilibration has no connection in its present highly evolved form with the function of hearing, though in the lowest animal forms hearing and equilibration are phases of a simple function, including all sensitivity to motion either of the external medium in which the animal lives or internal motion of the body. The major parts of the ear are the outer ear, consisting of the cartilaginous pinna, or visible ear, and the external meatus, or passage through which the sound is carried into the inner recess of the organ. Second, there is a middle ear separated from the outer ear by the tympanic membrane and connected with the outer world by the eustachian tube which passes from the middle ear to the throat cavity. Finally, there is an inner ear which is filled with liquid and includes a complex membrane known as the basilar membrane, upon which the sensory cells are seated. The structure of the inner ear and its relation to sound vibrations is such that each different pitch affects a separate group of cells. For this reason complicated sound vibrations may be analyzed by the ear into their component elements. Complex sounds are thus recognized in sensation in a very different way from complex colors, for the sensory surface of the eye does not analyze its impressions. The ear is also distinguished from the other organs of sense by the fact that it does not have any vivid after-effects from stimulation. There are practically no auditory after-images. For further discussion of the ear see NERVOUS SYSTEM.

C. H. J.

Ear, Hygiene of. — Among normal individuals there seem to be great individual variations in range of hearing, especially as regards the upper tone limits. While it is ordinarily supposed that the human ear can hear tones caused by vibrations within the limits of sixteen to twenty a second and 30,000 to 32,000 per second, recent investigations of the hearing of school children by Reik in Baltimore indicate that for many individuals the limits are much greater, and that for young people the normal limit for high tones is far above 32,000, and in many reaches 70,000 or more. So great are the individual variations that no definite norms can be established. Also individual differences are found in general auditory acuity, and the keenness of the sense of hearing probably varies with changing conditions of nutrition, fatigue, climate, etc. Just what is the range of normal variation is not known; but children who cannot hear what the majority of children can hear at a given distance are usually classed as deficient in hearing, and those that cannot hear at one third the distance that others can hear are deemed distinctly defective. (See TESTS OF HEARING.)

Diseases of the ear are common among children. The deafness that is apt to result is a defect that especially concerns school hygiene. The results of investigations vary greatly; but tests of hearing in thousands of schools have shown that from ten to thirty per cent of all school children are likely to have some defect of hearing in one or both ears. This is a serious handicap in school work. Children partially deaf may hear for a time in a dictation lesson or the like, then fail to hear, and thus misunderstand, and are blamed by their teachers for dullness or perverseness; and, even when such children hear, the strain upon attention in listening may be a serious matter. A knowledge of the condition of a pupil's hearing is important for the teacher; and for the sake of pedagogy as well as for hygiene, annual tests of hearing are desirable.

Bezold and many others have found indications of a correlation between the hearing of school children and their mental ability as shown in school work, a much larger number of dull children and laggards being found among those with defective hearing. Dr. Bruner, it is true, found no very considerable evidence of a correlation between acuity of hearing and intelligence. Nor are the results summarized by Ayres very striking in this respect, although he did find a larger percentage of children with defective hearing among the retarded than among the normal. Dr. Kerr of London has made special investigations in regard to this point, and in his results a strong tendency appears for children whose mental condition is "excellent," to drop back into the ranks of the "good" or "fair" when handicapped by defective hearing. The investigations in concrete cases show that children with defective hearing are apt to be badly handicapped and mistreated by teachers who are unaware of the fact.

Among the causes of defects of hearing the following have been distinguished: adenoid growths, the various contagious diseases, especially measles, scarlet fever, and diphtheria, also scrofula, colds, pulling of the ear muscles, careless methods of removing objects from the ear, violent sounds of cannon or the like, and carelessness in the hygiene of the nose. The most frequent causes are infectious diseases and diseases of the nose. The former cause deafness probably because in these diseases microörganisms develop in great numbers on the mucous membrane of the nose and are easily carried by the Eustachian tubes to the middle ear.

Some cases of psychic deafness are found, and a certain degree of psychic deafness is not uncommon. The facts are interesting and instructive to the hygienist. In hearing, as in other forms of sense perception, there are two factors, one subjective, one objective. Both are necessary. The sound to be perceived must be aroused in the mind as well as strike the ear from without. In technical terms, there must be preperception as well as the external stimulus. Deafness may result from loss or serious defect in either factor. Thus it comes to pass that we find two kinds of deafness, namely, physical deafness and psychic deafness.

Total or partial deafness from lack of preperception is more common than one would naturally suppose. The children of deaf and dumb parents, whether their ears are defective or not, are liable to be deaf, unless they are sent away from home or receive special instruction, because the psychic factor is not likely to be developed. Proper habits of preperception are not acquired unless children have the stimuli from the conversation of their companions. In children who are partially deaf, where the defect occurred in early childhood, so that conversation was imperfectly heard, the defective hearing is likely to be in large part due to psychic defect.

Since deafness may result from defect either in the mental factor or in the physical organ, so also improvement may begin with either factor. Remarkable results may be produced by training in cases of psychic deafness. Cases have been reported where children apparently totally deaf have been taught to hear. Also where there is a partial defect of hearing the need of acoustic training is especially great.

A number of important points which bear upon the hygiene of the ear may be briefly enumerated. In the first place, primitive people apparently have no better hearing than civilized people, in spite of ordinary popular opinion. Dr. Meyers, in his study of the natives in the Torres Straits, found that there was no evidence of greater acuity of hearing, the difference between these natives and Europeans being apparently merely that they take an interest in sounds that the European does not give attention to. Dr. Bruner, also, in his tests made at the World's Fair in Chicago, found that both in keenness and range of hearing the whites surpass primitive peoples. Again the range of hearing for children is greater than for those in old age, quite apart from defects in the hearing. Ear disease is especially liable to occur in childhood. Children of the poorer classes, as found by investigations of the school physician in Leipzig, show many more defective ears than the children of the well-to-do, many ear diseases perhaps being the result of scrofula, which attacks especially weaker and neglected children. The percentage of defective ears seems to vary also with the climate, a dry climate being favorable.

The ordinary rules of common sense should be regarded. Children should be trained not to put things into the ears, to be careful in case of any ear trouble not to let water run into the ears in washing and bathing, to avoid blowing the nose violently, and not to make loud noises in the ears of their companions, and in case of earache to report the fact to parents or teacher.

The duties of the teacher in the hygiene of the ear are briefly the following: to ascertain what pupils have ear disease or defects of hearing; to place such in favorable seats in the schoolroom; to learn whether such children actually hear what is said to them; to report cases of apparent ear disease to parents, nurses, or school physicians, and in general to be hygienically watchful and sympathetic toward such children.

It is not the place here to treat the various diseases of the ear, but it may be noted that the most dangerous of ear diseases, namely, septic inflammation of the middle ear, Denker found in nearly two per cent of the 4716 German school children studied by him, *i.e.*, perhaps one for every school class. Children with this disease should if possible be taught in special classes, as a single case pollutes the air of the schoolroom and is liable to be a source of infection.

Among the results of the studies of hearing in school children the following should be emphasized: —

(1) Apparently some thirty per cent of all school children have defective hearing. (2) Much can be done for such cases by proper medical and hygienic treatment. (3) Pupils partially deaf should receive psychic training. (4) Tests of hearing of school children should be made at least once a year, and all suspicious cases should be recommended to specialists. (5) There is considerable evidence of a correlation between the possession of normal acuity of hearing and good ability in class work. (6) Schoolhouses should be located in a quiet neighborhood, and the law should prohibit unnecessary noises in the vicinity.

W. H. B.

See NOSE, HYGIENE OF THE.

Tests of Hearing. — For educational purposes, the more elaborate tests of hearing, such as binaural pitch difference, integrity of the tonal scale, bone *vs.* air conduction, and the various tests which diagnose the seat of auditory defect are but seldom employed. The more common tests for auditory acuity may be divided, in terms of stimulus employed, into speech tests and instrumental tests, and in terms of procedure employed, into those that use the method of extreme range and those that use the method of percentage of accuracy at a constant range.

The *method of extreme range*, well illustrated in the ordinary watch test, consists in gradually moving the source of sound (or directing the pupil to move) from a position at which the sound is clearly heard to a position at which it can no longer be heard. Strictly, the reverse procedure should then be followed: that is, the distance from stimulus to ear should be taken such that the sound can certainly not be heard, and this distance should then be gradually reduced until the sound is heard. The average of these two determinations is the hearing distance. Although this method has been extensively employed in schoolroom tests, it entails one source of error that may be serious, viz., the error due to reflection of sound from walls and objects; thus, a sound perceptible at thirty feet may be imperceptible at twenty-five feet. It is quite probable that many schoolroom tests are invalidated by this unsuspected disturbing factor. To meet this difficulty, the *method of constant range* is to be recommended. Here a range must first be determined by preliminary trials such that not over ninety in one hundred of the sounds in use can be heard by a normal ear. This range is scrupulously maintained for all pupils to be tested: the same test sounds are given to each pupil, and acuity, save in cases where hearing is so defective that nothing is heard at this distance, is determined by the percentage of sounds correctly reported. This method is specially desirable in the conduct of whisper tests.

Whichever method is followed, the following precautions should be observed: (1) One ear should be examined at a time; the other should be closed tightly, either by pressing the tragus into the meatus with the fleshy part of the ball of the thumb, or by plugging the meatus with a rubber stopper. (2) For the best results, however, a final test should be made with both ears open and with the pupil facing the examiner as in ordinary listening. (3) The pupil should be instructed to keep his eyes closed and his mouth closed (since opening the mouth alters the hearing). (4) The pupil must not be expected to listen continuously without knowing when to expect the stimulus, but must always be warned about 1.5 seconds before the sound is to be given. (5) The stimulus should occasionally be omitted after the warning signal is given, in order to make sure that the pupil really hears.

Speech tests, which may be conducted either by whispered or by vocalized speech, and either by the method of extreme, or by the method of constant range, have one fundamental advantage, in that they afford an unequivocal test of the hearing of conversational speech, whereas all instrumental tests are in some measure partial or equivocal. Speech tests, however, are difficult to employ for four reasons: (1) Articulate speech entails the use of a great variety and complex combination of pitches of different intensity and timbre, so that not all speech elements have the same normal range. (2) Examiners cannot guarantee uniformity of enunciation and intensity of stress from test to test. (3) Speech is markedly affected by the acoustic properties of the room in which the test is held. (4) Unavoidable noises are more likely to interfere with speech tests than with instrumental tests conducted at close range. To offset these difficulties it is desirable (1) to select carefully a set of test numerals, (2) to practice the examiner in enunciation (especially by adopting the plan of whispering each test number at the end of an expiration of the breath), (3) to use the method of constant range, and (4) to select a quiet room and re-test doubtful cases under more favorable conditions or by other methods.

The *watch test* is the one most widely used. Its advantages are convenience, accessibility, and relatively short range. Its disadvantages are that it fails adequately to test capacity to hear speech, that its sounds give rise to a perception of rhythm, that its ticking is so familiar that illusions of hearing arise, and that different watches vary in intensity and quality of tick. For these last reasons various forms of acoumeters have been invented to replace the watch. Politzer's acoumeter is best known and extensively used in clinical work. In it the fall of a tiny hammer from a constant height upon a steel rod gives a brief tone (512 vibrations) of constant intensity. In use the examiner ascertains the maximal distance at which the subject can report correctly the number of " clicks " (two to five) that he makes. Lehmann's acoumeter allows variations in the intensity of its stimulus (a small steel shot dropped from varying heights upon a metal, glass, or cardboard shelf), so that it may be employed within the limits of an ordinary room and at a constant range.

To exclude disturbing noises, several experimenters have contrived instruments in which the stimulus is a click produced in a telephone receiver held close to the ear; the intensity is varied by introducing more or less resistance in the circuit. The best known of these instruments is Seashore's audiometer (*q.v.*), which has been extensively used by him and by others, especially by Smedley and MacMillan in the investigations of the Bureau of Child Study and Pedagogic Investigation connected with the Chicago public schools.

Most tests of hearing yield only relative results, *i.e.*, the acuity of a given pupil can be stated only with reference to the average performance of his mates under the particular conditions (make of watch, voice of teacher, size of room, arrangements of furniture, etc.) which prevailed in the test. Divergence in the results of hearing tests is due in part to this absence of standardization. What one examiner deems normal another may rank as defective.

A rough preliminary test of hearing may be made by placing all the pupils in a room at the limit of the ordinary classroom distance (32 feet), directing them in a whisper to perform some unusual movement, such as placing the right forefinger on the palm of the left hand. Note those who fail to respond or who do so in evident imitation of others. Or use a series of two-place whispered numbers, and let each pupil record them with pencil and paper. G. M. W.

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EAR TRAINING. — Special exercises in ear training are given in schools to increase the power of discriminating among sounds. Such work is usual in the teaching of music. It is also used in teaching children to read, more particularly beginners and foreigners. Such exercises have been highly artificial and formal in nature. They are much less used than hitherto, the teacher relying for the requisite practice upon the recurrence of the difficult sounds in words, phrases, and other natural thought units rather than in specially invented devices. H. S.

See Music, Teaching of; Reading, Teaching of.

EAR MINDEDNESS. — See Eye and Ear Mindedness.

EARLHAM COLLEGE, RICHMOND, IND. — A coeducational institution which grew out of a school established in 1847 and organized as a college in 1859. In the promotion of advanced practical instruction in science Earlham College was one of the first institutions in the West. The institution is controlled by its founders, the orthodox Friends. Admission to the college is by certificate or examination based on a four years' high school course. Degrees of Bachelor of Arts and Bachelor of Science are conferred on completion of a four years' course, including prescribed subjects, a major subject, and elective subjects. The master's degree is given on one year's postgraduate work in residence. Professional work for teachers is also offered as well as courses in music. The college is located on a campus, forty acres in extent, and includes eight buildings used for recitations and dormitories. The productive funds of the institution amount (1911) to $350,000, and the total income, including tuition fees, to $41,867. The enrollment of students, including summer school, was 558 in 1909–1910. There is a faculty of thirty members.

EARLY CHRISTIAN SCHOOLS. — See CHRISTIAN EDUCATION IN THE EARLY CHURCH.

EARLY, JOHN (1814–1874). — Jesuit educator; was president of Holy Cross College at Worcester, Mass., founder and first president of St. Ignatius College at Baltimore, and president of Georgetown College at Washington, D.C. W. S. M.

EAST INDIA SERVICE, TRAINING FOR. — See PUBLIC SERVICE, TRAINING FOR.

EASTBOURNE COLLEGE. — See GRAMMAR SCHOOLS, ENGLISH; COLLEGES, ENGLISH; PUBLIC SCHOOLS.

EASTBROOK, JOSEPH (1820–1894). — A Michigan educator, educated in the public schools and at Oberlin College. He was principal of the schools at Ypsilanti (1853–1858), superintendent of the schools of East Saginaw (1858–1871), principal of the Michigan State Normal School at Ypsilanti (1871–1880), president of Olivet College (1880–1886), and state superintendent of schools in Michigan (1886–1890). W. S. M.

EASTERN COLLEGE, MANASSAS, VA. — A coeducational institution maintaining a college of liberal arts, teachers' training department, an academy, and schools of expression, music, commerce, and fine arts. Admission to the college is by certificate from an approved school or by examination. The degree of A.B. is conferred on completion of a four years' course. A postgraduate course leading to the M.A. is also offered. There are twenty-three members on the faculty.

EASTMAN, HARVEY GRIDLEY (1832–1878). — Founder of a chain of commercial schools in the United States, and for many years president of the Eastman Business College at Poughkeepsie. His first commercial school was founded at St. Louis in 1855. W. S. M.

See COMMERCIAL EDUCATION.

EATON, AMOS (1777–1842). — Scientist and first president of Rensselaer Polytechnic Institute; was graduated from Williams College in 1799, and was for several years lecturer on science at that institution. He was president of the Rensselaer Institute at Troy from 1824 to 1842, and was the author of textbooks on botany, zoölogy, physics, and geology, and numerous scientific works. W. S. M.

EATON, JOHN (1829–1906). — Second commissioner of education of the United States, born at Sutton, N. H., the 5th of December, 1829. He was educated at Thetford Academy and Dartmouth College, where he was graduated in 1854, subsequently completing a course at the Andover Theological Seminary. He was teacher and principal of schools at Cleveland (1854–1856), superintendent of schools at Toledo (1856–1859), served in the civil war, attaining the rank of brigadier-general, state superintendent of schools in Tennessee (1867–1869), and United States Commissioner of Education (1871–1886). Besides his writings in the annual reports of the Bureau of Education, he wrote a history of Thetford Academy, and numerous papers on the education of the freedmen. He died in 1906. W. S. M.

EATON, NATHANIEL (1609–1660). — The first professor in Harvard College, and acting president (master) until the appointment of President Dunster. He had previously been engaged in secondary school work in Massachusetts. W. S. M.

See HARVARD UNIVERSITY.

EBBINGHAUS, HERMANN (1850–1909). — One of the pioneers in the study of experimental psychology. After an education in the gymnasium of his own town, Barmen, he studied at Bonn, Halle, and Berlin, and after serving in the army during the Franco-German War took his Ph.D. degree at Bonn in 1873 with a dissertation on *Hartmann's Philosophy of the Unconscious.* Although his early studies had been in pure philosophy, and he had as private docent at Berlin lectured on the history of philosophy, it was soon evident that his main interest lay in the field of experimental psychology, which, he always insisted, was a branch of the natural sciences rather than philosophy, as it had hitherto been classed. In 1886 he became extraordinary professor at Berlin, in 1894 professor at Breslau, and in 1905 professor at Halle. His most important contribution to psychology was the application of quantitative measurement to mental phenomena, especially memory. In 1890 he established the first important psychological journal in Germany, *Zeitschrift für Psychologie und Physiologie der Sinnesorgane.* His most important publications are *Über das Gedächtnis; Untersuchungen zur experimentellen Psychologie* (Leipzig, 1885); *Grundzüge der Psychologie* (Leipzig, 1897–1902); *Abriss der Psychologie* (Leipzig, 1907; trans., New York, 1908); *Über eine neue Methode zur Prüfung geistiger Fähigkeiten und ihre Anwendung bei Schulkindern* (in *Zeitschr. f. Psych.* Vol. 13, pp. 401–459), advocating the combination method for measuring intellectual ability.

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WOODWORTH, R. *Journal of Philosophy,* Vol. VI, p. 253.

EBBINGHAUS' TEST. — The German psychologist, Ebbinghaus (*q.v.*), called attention to the fact that most psychological tests deal with very restricted forms of mental activity. He suggested that a more general type of mental activity could be called out and could be measured by presenting to the person to be tested a paragraph in which words were here and there left out. The filling in of the blanks in such a paragraph will require time, which will be shorter or longer according to the ability of the person being tested to apprehend the general meaning of the sentences and to supply the associated words necessary to complete this meaning. The degree of correctness with which the supplied words fill out the sense will also serve as a measure of intelligence.

C. H. J.

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Ebbinghaus, H. *Zeitschrift für Psychologie*, etc. Vol. XIII (1896–1897), pp. 401–459.

EBERHARD BETHUNIENSIS. — A grammarian of Béthune in Artois. The writer of a Latin Grammar, called the *Graecismus*. It was written about 1212, and was in use in the schools until the time of Erasmus, who speaks of it as a textbook at Deventer in 1476. The importance attached to the *Graecismus*, along with the *Doctrinale* of Alexander de Villa Dei, may be proved by the fact that they were both prescribed as textbooks in universities, *e.g.* in the statutes of Toulouse, 1328, of Paris, 1366, of Vienna, 1389. As early printed the work is entitled: *Graecismus, de figuris et octo partibus orationis sive grammaticae regulae versibus latinis explicatae, cum expositionibus Joannis Vincentii Metulini* (Paris, 1487). The *Graecismus*, as well as the *Doctrinale*, was already glossed before 1270. Vergil is the author chiefly quoted, and next follow Ovid, Lucan, Horace, Statius, and Terence. The amount of Greek dealt with is very small, viz. chiefly in chapters of the technical figures of speech and in ch. viii words derived from the Greek. Eberhard has been suggested as the author of (1) the well-known medieval work *Labyrinthus;* (2) *Anti-haeresos* (one of three joint writings); and several other works.

F. W.

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ECKOFF, WILLIAM JULIUS (1853–1908). — Educational writer, educated in Germany and at New York University and Columbia University; principal of a college in Nicaragua; professor of pedagogy in the University of Illinois; author of *Herbart's A B C of Sense-perception*, and numerous articles in educational journals.

W. S. M.

ECLECTIC METHOD. — A method which combines the essential elements of several systems of instruction. The term is more particularly applied to mixed or combination methods of teaching reading. In teaching reading to beginners there are many special methods, such as the word method, sentence method, phonetic method, etc. An eclectic method would follow no one of these exclusively, but would select and appropriate what is considered most valuable in each.

H. S.

See Reading, Teaching Beginners; Combined Method.

ÉCOLE DES ROCHES. — One of the new schools (*q.v.*) established in France by M. Edmond Demolins in 1899. It is situated on a large estate near the rocky cliffs of Normandy whence it derives its name. This school and others that followed its example arose as a protest against the secondary school system in France, which to the leaders of the movement was not only too bureaucratic and uniform, but was entirely suppressive of the individual. M. Demolins outlined his scheme for a new school in a book, *L'Éducation Nouvelle*, published in 1898, and as a result was able to open his school in 1899 with fifty pupils. The aim of the school is " to make strong boys, independent in character and masters of themselves." The ideal is borrowed mainly from the English public schools and schools like Abbotsholme. Provision is made for constant personal relations between pupils and teachers on a basis of common interests. Physical culture, outdoor exercises, and hygiene form important features of the school; manual work both in and out of doors, visits to different industrial centers, may also be mentioned, as well as the emphasis laid on practical science work. The classics are postponed to the fifth year at school, and are taught mainly by the aid of translations. The pupils are encouraged to spend from three months to a year in England or Germany to learn foreign languages. In place of the barrack type of internat, home surroundings are reproduced. The *École des Roches* and others of this type, while successful in calling attention to the weaknesses of the French secondary school system before the recent reforms, have on the whole not met with any general response, — thus illustrating an educational truth that a system cannot be bodily transferred from one country to another with any degree of success.

See Abbotsholme; Bedales; Experimental Schools; New Schools.

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ÉCOLES MATERNELLES. — See France, Education in.

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ECOLOGY. — See Botany.

ECONOMICS.— History. — The science now known as Economics was for a long time called Political Economy. This term is due to a Frenchman — Montchrétien, Sieur de Watteville — who wrote in 1615 a book with that title, employing a term which had been used in a slightly different sense by Aristotle. During the Middle Ages economic questions were regarded very largely from the moral and theological point of view, so that the discussions of the day were directed rather to a consideration of what ought to be, than of what is.

The revolution of prices in the sixteenth century and the growth of capital led to great economic changes, which brought into the foreground, as of fundamental importance, questions of commerce and industry. Above all, the breakdown of the feudal system and the formation of national states emphasized the considerations of national wealth and laid stress on the possibility of governmental action in furthering national interests. This led to a discussion of economic problems on a somewhat broader scale, — a discussion now carried on, not by theologians and canonists, but by practical business men and by philosophers interested in the newer political and social questions. The emphasis laid upon the action of the State also explains the name Political Economy. Most of the discussions, however, turned on the analysis of particular problems, and what was slowly built up was a body of practical precepts rather than of theoretic principles, although, of course, both the rules of action and the legislation which embodied them rested at bottom on theories which were not yet adequately formulated.

The origin of the modern science of economics, which may be traced back to the third quarter of the eighteenth century, is due to three fundamental causes. In the first place, the development of capitalistic enterprise and the differentiation between the laborer and the capitalist brought into prominence the various shares in distribution, notably the wages of the laborer, the profits of the capitalist, and the rent of the landowner. The attempt to analyze the meaning of these different shares and their relation to national wealth was the chief concern of the body of thinkers in France known as *Physiocrats*, who also called themselves *Philosophes-Économistes*, or simply *Économistes*, of whom the court physician of Louis XVI, Quesnay, was the head, and who published their books in 1757–1780.

The second step in the evolution of economic science was taken by Adam Smith (*q.v.*). In the chair of philosophy at the University of Glasgow, to which Adam Smith was appointed in 1754, and in which he succeeded Hutcheson, it was customary to lecture on natural law in some of its applications to politics. Gradually, with the emergence of the more important economic problems, the same attempt to find an underlying natural explanation for existing phenomena was extended to the sphere of industry and trade; and during the early sixties Adam Smith discussed these problems before his classes under the head of "police." Finally, after a sojourn in France and an acquaintance with the French ideas, Adam Smith developed his general doctrines in his immortal work, *The Wealth of Nations*, published in 1776. When the industrial revolution, which was just beginning as Adam Smith wrote, had made its influence felt in the early decades of the nineteenth century, Ricardo attempted to give the first thorough analysis of our modern factory system of industrial life, and this completed the framework of the structure of economic science which is now being gradually filled out.

The third element in the formation of modern economics was the need of elaborating an administrative system in managing the government property of the smaller German and Italian rulers, toward the end of the eighteenth century. This was the period of the so-called police state when the government conducted many enterprises which are now left in private hands. In some of the German principalities, for instance, the management of the government lands, mines, industries, etc., was assigned to groups of officials known as *chambers*. In their endeavor to elaborate proper methods of administration these chamber officials and their advisors gradually worked out a system of principles to explain the administrative rules. The books written, as well as the teaching chairs founded, to expound these principles came under the designation of the Chamber sciences (*Cameralia* or *Cameral-Wissenschaften*) — a term still employed to-day at the University of Heidelberg. As Adam Smith's work became known in Germany and Italy by translations, the chamber sciences gradually merged into the science of political economy.

Finally, with the development of the last few decades, which has relegated to the background the administrative and political side of the discipline, and has brought forward the purely scientific character of the subject, the term Political Economy has gradually given way to Economics.

Development of Economic Teaching. — *Europe.* — As has been intimated in the preceding section, the first attempts to teach what we to-day would call economics were found in the European universities which taught natural law, and in some of the Continental countries where the chamber sciences were pursued. The first independent chairs of political economy were those of Naples in 1753, of which the first incumbent was Genovesi, and the professorship of cameral science at Vienna in 1763, of which the first incumbent was Sonnenfels. It was not, however, until the nineteenth century that political economy was generally introduced as a university discipline. When the new University of Berlin was created in 1810, provision was made for teaching in economics, and this gradually spread to the other German universities. In France a chair of economics was established in 1830 in the Collège de France, and later on in some of the technical schools; but economics did not become a part of the regular university curriculum until the close of the seventies, when chairs of political economy were created in the faculties of law, and not, as was customary in the other Continental countries, in the faculties of philosophy. In England the first professorship of political economy was that instituted in 1805 at Haileybury College, which trained the students for the East India service. The first incumbent of this chair was Malthus. At University College, London, a chair of economics was established in 1828, with McCulloch as the first incumbent; and at Dublin a chair was founded in Trinity College in 1832 by Archbishop Whately; at Oxford a professorship was established in 1825, with Nassau W. Senior as the first incumbent. His successors were Richard Whately (1830), W. F. Lloyd (1836), H. Merivale (1838), Travers Twiss (1842), Senior (1847), G. K. Richards (1852), Charles Neate (1857), Thorold Rogers (1862), Bonamy Price (1868), Thorold Rogers (1888), and F. Y. Edgeworth (1891). At Cambridge the professorship dates from 1863, the first incumbent being Henry Fawcett, who was followed by Alfred Marshall in 1884 and by A. C. Pigou in 1908. In all these places, however, comparatively little attention was paid at first to the teaching of economics, and it was not until the close of the nineteenth century and the beginning of the twentieth that any marked progress was made, although the professorship at King's College, London, dates back to 1859, and that at the University of Edinburgh to 1871. Toward the close of the nineteenth century, chairs in economics were created in the provincial universities, especially at Birmingham, Manchester, Liverpool, Sheffield, Bristol, Durham, and the like, as well as in Scotland and Wales; and a great impetus to the teaching of economics was given by the foundation, in 1895, of the London School of Economics, which has recently been made a part of the University of London.

United States. — Economics was taught at first in the United States, as in England, by incumbents of the chair of philosophy; but no especial attention was paid to the study, and no differentiation of the subject matter was made. The first professorship in the title of which the subject is distinctively mentioned was that instituted at Columbia College, New York, where John McVickar, who had previously lectured on the subject under the head of philosophy, was made professor of moral philosophy and political economy in 1819. In order to commemorate this fact, Columbia University established some years ago the McVickar professorship of political economy. The second professorship in the United States was instituted at South Carolina College, Columbia, S. C., where Thomas Cooper, professor of chemistry, had the subject of political economy added to the title of his chair in 1826. A professorship of similar sectional influence was that in political economy, history, and metaphysics filled in the College of William and Mary in 1827, by Thomas Roderick Dew (1802–1846). The separate professorships of political economy, however, did not come until after the Civil War. Harvard established a professorship of political economy in 1871; Yale in 1872; and Johns Hopkins in 1876.

The real development of economic teaching on a large scale began at the close of the seventies and during the early eighties. The newer problems bequeathed to the country by the Civil War were primarily economic in character. The rapid growth of industrial capitalism brought to the front a multitude of questions, whereas before the war well-nigh the only economic problems had been those of free trade and of banking, which were treated primarily from the point of view of partisan politics. The newer problems that confronted the country led to the exodus of a number of young men to Germany, and with their return at the end of the seventies and beginning of the eighties, chairs were rapidly multiplied in all the larger universities. Among these younger men were Patten and James, who went to the University of Pennsylvania; Clark, of Amherst and later of Columbia; Farnam and Hadley of Yale; Taussig of Harvard; H. C. Adams of Michigan; Mayo-Smith and Seligman of Columbia ; and Ely of Johns Hopkins. The teaching of economics on a university basis at Johns Hopkins under General Francis A. Walker helped to create a group of younger scholars who soon filled the chairs of economics throughout the country. In 1879 the School of Political Science at Columbia was inaugurated on a university basis, and did its share in training the future teachers of the country. Gradually the teaching force was increased in all the larger universities, and chairs were started in the colleges throughout the length and breadth of the land.

At the present time, most of the several hundred colleges in the United States offer instruction in the subject, and each of the larger institutions has a staff of instructors devoted to it. At institutions like Columbia, Harvard, Yale, Chicago, and Wisconsin there are from six to ten professors of economics and social science, together with a corps of lecturers, instructors, and tutors.

Teaching of Economics in the American Universities. — The present-day problems of the teaching of economics in higher institutions of learning are seriously affected by the transition stage through which these institutions are passing. In the old American college, when economics was introduced it was taught as a part of the curriculum designed to instill general culture. As the graduate courses were added, the more distinctly professional and technical phases of the subject were naturally emphasized. As a consequence, both the content of the course and the method employed tended to differentiate. But the unequal development of our various institutions has brought great unclearness into the whole pedagogical problem. Even the nomenclature is uncertain. In one sense graduate courses may be opposed to undergraduate courses; and if the undergraduate courses are called the college courses, then the graduate courses should be called the university courses. The term "university," however, is coming more and more, in America at least, to be applied to the entire complex of the institutional activities, and the college proper or undergraduate department is considered a part of the university. Furthermore, if by university courses as opposed to college courses we mean advanced, professional, or technical courses, a difficulty arises from the fact that the latter year or years of the college course are tending to become advanced or professional in character. Some institutions have introduced the combined course, that is, a combination of so-called college and professional courses; other institutions permit students to secure their baccalaureate degree at the end of three or even two and a half years. In both cases, the last year of the college will then cover advanced work, although in the one case it may be called undergraduate, and in the other graduate, work.

The confusion consequent upon this unequal development has had a deleterious influence on the teaching of economics, as it has in many other subjects. In all our institutions we find a preliminary or beginners' course in economics, and in our largest institutions we find some courses reserved expressly for advanced or graduate students. In between these, however, there is a broad field, which, in some institutions, is cultivated primarily from the point of view of graduates, in others from the point of view of undergraduates, and in most cases is declared to be open to both graduates and undergraduates. This is manifestly unfortunate. For, if the courses, are treated according to advanced or graduate methods, they do not fulfill their proper function as college studies. On the other hand, if they are treated as undergraduate courses, they are more or less unsuitable for advanced or graduate students. In almost all of the American institutions the same professors conduct both kinds of courses. In only one institution, namely, at Columbia University, is the distinction between graduate and undergraduate courses in economics at all clearly drawn, although even there not with precision. At Columbia University, of the ten professors who are conducting courses in economics and social science, one half have seats only in the graduate faculties, and do no work at all in the college or undergraduate department; but even there, these professors give a few courses, which, while frequented to an overwhelming extent by graduate students, are open to such undergraduates as may be declared to be advanced students.

It is necessary, therefore, to distinguish, in principle at least, between the undergraduate or college courses properly so-called, and the university or graduate courses. For it is everywhere conceded that at the extremes, at least, different pedagogical methods are appropriate.

The College or Undergraduate Instruction. — Almost everywhere in the American colleges there is a general or preliminary or foundation course in economics. This ordinarily occupies three hours a week for the entire year, or five hours a week for the semester, or half year, although the three-hour course in the fundamental principles occasionally continues only for a semester. The foundation of such a course is everywhere textbook work, with oral discussion, or quizzes, and frequent tests. Where the number of students is small, this method can be effectively employed; but where, as in our larger institutions, the students attending this preliminary course are numbered by the hundreds, the difficulties multiply. Various methods are employed to solve these difficulties. In some cases the class attends as a whole at a lecture which is given once a week by the professor, while at the other two weekly sessions the class is divided into small sections of from twenty to thirty, each of them in charge of an instructor who carries on the drill work. In a few instances, these sections are conducted in part by the same professor who gives the lecture, in part by other professors of equal grade. In other cases where this forms too great a drain upon the strength of the faculty, the sections are put in the hands of younger instructors or drill masters. In other cases, again, the whole class meets for lecture purposes twice a week, and the sections meet for quiz work only once a week. Finally, the instruction is sometime carried on entirely by lectures to the whole class, supplemented by numerous written tests.

While it cannot be said that any fixed method has yet been determined, there is a growing consensus of opinion that the best results can be reached by the combination of one general lecture and two quiz hours in sections. The object of the general lecture is to present a point of view from which the problems may be taken up, and to awaken a general interest in the subject among the students. The object of the section work is to drill the students thoroughly in the principles of the science; and for this purpose it is important in a subject like economics to put the sections as far as possible in the hands of skilled instructors rather than of recent graduates.

Where additional courses are offered to the undergraduates, they deal with special subjects in the domain of economic history, statistics, and practical economics. In many such courses good textbooks are now available, and especially in the last class of subjects an attempt is being made here and there to introduce the case system as utilized in the law schools. This method is, however, attended by some difficulties, arising from the fact that the materials used so quickly become antiquated and do not have the compelling force of precedent, as is the case in law. In the ordinary college course, therefore, chief reliance must still be put upon the independent work and the fresh illustrations that are brought to the classroom by the instructor.

In some American colleges the mistake has been made of introducing into the college curriculum methods that are suitable only to the university. Prominent among these are the exclusive use of the lecture system, and the employment of the so-called seminar. This, however, only tends to confusion. On the other hand, in some of the larger colleges the classroom work is advantageously supplemented by discussions and debates in the economics club, and by practical exercises in dealing with the current economic problems as they are presented in the daily press.

In most institutions the study of economics is not begun until the sophomore or the junior year, it being deemed desirable to have a certain maturity of judgment and a certain preparation in history and logic. In some instances, however, the study of economics is undertaken at the very beginning of the college course, with the resulting difficulty of inadequately distinguishing between graduate and undergraduate work.

Another pedagogical question which has given rise to some difficulty is the sequence of courses. Since the historical method in economics became prominent, it is everywhere recognized that some training in the historical development of economic institutions is necessary to a comprehension of existing facts. We can know what is very much better by grasping what has been and how it has come to be. The point of difference, however, is as to whether the elementary course in the principles should come first and be supplemented by a course in economic history, or whether, on the contrary, the course in economic history should precede that in the principles. Some institutions follow one method, others the second; and there are good arguments on both sides. It is the belief of the writer, founded on a long experience, that on the whole the best results can be reached by giving as introductory to the study of economic principles a short survey of the leading points of economic history. In a few of the modern textbooks this plan is intentionally followed. Taking it all in all, it may be said that college instruction in economics is now not only exceedingly widespread in the United States, but continually improving in character and methods.

University or Graduate Instruction. — The university courses in economics are designed primarily for those who either wish to prepare themselves for the teaching of economics or who desire such technical training in methods or such an intimate acquaintance with the more developed matter as is usually required by advanced or professional students in any discipline. The university courses in the larger American institutions which now take up every important subject in the discipline, and which are conducted by a corps of professors, comprise three elements: first, the lectures of the professor; second, the seminar or periodical meeting between the professor and a group of advanced students; third, the economics club, or meeting of the students without the professor.

(1) The Lectures: In the university lectures the method is different from that in the college courses. The object is not to discipline the student, but to give him an opportunity of coming into contact with the leaders of thought and with the latest results of scientific advance on the subject. Thus no roll of attendance is called, and no quizzes are enforced and no periodical tests of scholarship are expected. In the case of candidates for the Ph.D. degree, for instance, there is usually no examination until the final oral examination, when the student is expected to display a proper acquaintance with the whole subject. The lectures, moreover, do not attempt to present the subject in a dogmatic way, as is more or less necessary in the college courses, but, on the contrary, are designed to present primarily the unsettled problems and to stimulate the students to independent thinking. The university lecture, in short, is expected to give to the student what cannot be found in the books on the subject.

(2) The Seminar: Even with the best of will, however, the necessary limitations prevent the lecturer from going into the minute details of the subject. In order to provide opportunity for this, as well as for a systematic training of the advanced students in the method of attacking this problem, periodical meetings between the professor and the students have now become customary under the name of the seminar, introduced from Germany. In most of our advanced universities the seminar is restricted to those students who are candidates for the degree of Doctor of Philosophy, although in some cases a preliminary seminar is arranged for graduate students who are candidates for the degree of Master of Arts. Almost everywhere a reading knowledge of French and German is required. In the United States, as on the European continent generally, there are

minor variations in the conduct of the seminar. Some professors restrict the attendance to a small group of most advanced students, of from fifteen to twenty-five; others virtually take in all those who apply. Manifestly the personal contact and the "give and take," which are so important a feature of the seminar, become more difficult as the numbers increase. Again, in some institutions each professor has a seminar of his own; but this is possible only where the number of graduate students is large. In other cases the seminar consists of the students meeting with a whole group of professors. While this has a certain advantage of its own, it labors under the serious difficulty that the individual professor is not able to impress his own ideas and his own personality so effectively on the students; and in our modern universities students are coming more and more to attend the institution for the sake of some one man with whom they wish to study. Finally, the method of conducting the seminar differs in that in some cases only one general subject is assigned to the members for the whole term, each session being taken up by discussion of a different phase of the general subject. In other cases a new subject is taken up at every meeting of the seminar. The advantage of the latter method is to permit a greater range of topics, and to enable each student to report on the topic in which he is especially interested, and which, perhaps, he may be taking up for his doctor's dissertation. The advantage of the former method is that it enables the seminar to enter into the more minute details of the general subject, and thus to emphasize with more precision the methods of work. The best plan would seem to be to devote half the year to the former method, and half the year to the latter method.

In certain branches of the subject, as, for instance, statistics, the seminar becomes a laboratory exercise. In the largest universities the statistical laboratory is equipped with all manner of mechanical devices, and the practical exercises take up a considerable part of the time. The statistical laboratories are especially designed to train the advanced student in the methods of handling statistical material.

(3) The Economics Club: The lecture work and the seminar are now frequently supplemented by the economics club, a more informal meeting of the advanced students, where they are free from the constraint that is necessarily present in the seminar, and where they have a chance to debate, perhaps more unreservedly, some of the topics taken up in the lectures and in the seminar, and especially the points where some of the students dissent from the lecturer. Reports on the latest periodical literature are sometimes made in the seminar and sometimes in the economics club; and the club also provides an opportunity for inviting distinguished outsiders in the various subjects. In one way or another, the economics club serves as a useful supplement to the lectures and the seminar, and is now found in almost all the leading universities.

In reviewing the whole subject we may say that the teaching of economics in American institutions has never been in so satisfactory condition as at present. Both the instructors and the students are everywhere increasing in numbers; and the growing recognition of the fact that law and politics are so closely interrelated with, and so largely based on, economics, has led to a remarkable increase in the interest taken in the subject and in the facilities for instruction. E. R. A. S.

Economics. — In the Schools. — This subject has been defined as the study of that which pertains to the satisfaction of man's material needs, — the production, preservation, and distribution of wealth. As such it would seem fundamental that the study of economics should find a place in those institutions which prepare children to become citizens, — the elementary and high schools. Some of the truths of economics are so simple that even the youngest of school children may be taught to understand them. As a school study, however, economics up to the present time has made far less headway than civics (*q.v.*). Its introduction as a study even in the colleges was so gradual and so retarded that it could scarcely be expected that educators would favor its introduction in the high schools.

Previous to the appearance, in 1894, of the *Report of the Committee of Ten* of the National Educational Association on Secondary Education, there had been much discussion on the educational value of the study of economics. In that year Professor Patten had written a paper on *Economics in Elementary Schools*, not as a plea for its study there, but as an attempt to show how the ethical value of the subject could be made use of by teachers. The *Report*, however, came out emphatically against formal instruction in political economy in the secondary school, and recommended "that, in connection particularly with United States history, civil government, and commercial geography, instruction be given in those economic topics, a knowledge of which is essential to the understanding of our economic life and development" (pp. 181–183). This view met with the disapproval of many teachers. In 1895 President Thwing of Western Reserve University, in an address before the National Educational Association on *The Teaching of Political Economy in the Secondary Schools*, maintained that the subject could easily be made intelligible to the young. Articles or addresses of similar import followed by Commons (1895), James (1897), Haynes (1897), Stewart (1898), and Taussig (1899). Occasionally a voice was raised against its formal study in the high schools. In the *School Review* for January, 1898, Professor Dixon of Dartmouth said that its teaching in the secondary schools was "unsatisfactory and unwise." On the other hand, Professor Stewart of the Central Manual Training School of Philadelphia, in an address in April, 1898, declared the *Report of the Committee of Ten* "decidedly reactionary," and prophesied that political economy as a study would be put to the front in the high school. In 1899 Professor Clow of the Oshkosh State Normal School published an exhaustive study of the subject of *Economics as a School Study,* going into the questions of its educational value, its place in the schools, the forms of the study, and the methods of teaching. His researches serve to show that the subject was more commonly taught in the high schools of the Middle West than in the East. (Compare with the article on CIVICS.)

Since the publication of his work the subject of economics has gradually made its appearance in the curricula of many Eastern high schools. It has been made an elective subject of examination for graduation from high schools by the Regents of New York State, and for admission to college by Harvard University. Its position as an elective study, however, has not led many students to take it except in commercial high schools, because in general it may not be used for admission to the colleges.

Its great educational value, its close touch with the pupils' everyday life, and the possibility of teaching it to pupils of high school age are now generally recognized. A series of articles in the National Educational Association's *Proceedings* for 1901, by Spiers, Gunton, Halleck, and Vincent bear witness to this. The October, 1910, meeting of the New England History Teachers' Association was entirely devoted to a discussion of the Teaching of Economics in Secondary Schools, and Professors Taussig and Haynes reiterated views already expressed. Representatives of the recently developed commercial and trade schools expressed themselves in its favor.

Suitable textbooks in the subject for secondary schools have not kept pace with its spread in the schools. Laughlin, Macvane, and Walker published books somewhat simply expressed; but later texts have been too collegiate in character. There is still needed a text written with the secondary school student constantly in mind, and preferably by an author who has been dealing with students of secondary school age. The methods of teaching, *mutatis mutandis,* have been much the same as those pursued in civics (*q.v.*). The mere cramming of the text found in the poorest schools gives way in the best schools to a study and observation of actual conditions in the world of to-day. In the latter schools the teacher has been well trained in the subject, whereas in the former it is given over only too frequently to teachers who know little more about it than that which is in the text.

J. S.

See also COMMERCIAL EDUCATION.

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ECUADOR, EDUCATION IN. — Ecuador, republic; area, 116,000 square miles; population, 1,205,000. By the constitution of 1884 and subsequent modifications, of which the latest was adopted in 1907, Ecuador comprises sixteen provinces administered by governors appointed by the President of the Republic. The earlier education laws provided for a public system of education under the supreme direction of the minister of public instruction. The individual provinces were required to provide primary schools which should be free, and attendance at the same compulsory for all children not under private instruction. The costs of primary education are borne by state, provincial, and municipal funds. Secondary and higher education were also placed under the general direction of the minister. The conditions of the country, however, have prevented rapid and substantial progress as regards the provision of primary schools, and with the exception of a few national colleges, or *liceos,* secondary education has been left to church establishments. By the constitution, the Roman Catholic religion is declared to be that of the nation, but all denominations are tolerated, and the national church is subject to the State; members of the episcopacy must be citizens of Ecuador, and the educational institutions of the church must conform to legal requirements. The control over education has been exercised by the minister, chiefly through regulations pertaining to courses of study, standards for government diplomas, etc., and to corrective measures based upon the annual reports of the directors of provincial institutions and primary schools.

According to the latest reports there are 1088 primary schools, 35 secondary schools (*liceos*), and 9 institutions for higher education. The number of teachers in primary and secondary schools was about 1500 in 1908, and the number of pupils 68,380, or a little less than six per cent of the population. In comparing the low rate of school attendance in Ecuador with that of the leading nations, it must be remembered that a large part of the population consists of Indians; about 400,000 are of mixed race; and a relatively small proportion are unmixed, being of European birth or origin. The system of government and of school administration is the work, in the main, of the mixed race, and affords interesting proof of their political aspirations and purposes.

At present the reform of education engages the attention of both central and provincial authorities. The law of September 24, 1906, providing for the decentralization of the primary system, was intended to incite the local authorities to a deeper sense of responsibility and more earnest efforts in respect to the provision and maintenance of public schools. But the policy is regarded by many as premature. For one reason, it does not conform to the established centralization of the fiscal system of the country, which precludes absolute autonomy on the part of the provinces. At the same time, the policy exposes the state to the perils of neglect and indifference on the part of backward provinces. A vigorous system of state supervision seems to be the only safeguard against glaring inequalities of school provision in the different divisions. Among reforms proposed in the general exposition of the law are the increase of primary schools, the enforcement of the compulsory law, and the improvement of the teaching force. The law provides that rural schools shall be established and maintained by the owners of every estate where there are twenty or more children; this would require a minute census of Indians, who are chiefly employed on the estates, and the preparation of tables and registers showing both the rich proprietors, who are able to maintain schools by themselves, and the small owners, who can support them by contributions *pro rata*. In the more progressive communities problems of school sanitation are exciting attention, and a few municipalities have taken measures for the medical inspection of schools. Normal schools are included in the reform measures, and the principles of modern pedagogy and equipment for the pursuit of manual training and agriculture are transforming the spirit and method of their training.

As regards secondary schools the need of radical reforms is clearly recognized. The rector of the *Colegio Bolivar* in a recent report to the minister of public instruction proposes certain changes in the system with a view to making secondary instruction a continuation of primary. "Secondary instruction ought," he says, "to give a general training based on the study of the native language and foreign languages, and the sciences, and should be a development of the primary program — keeping in mind that all knowledge is sterile if it has no application in practical life in the arts and business. Education should prepare the pupil for any career, whether scientific, literary, industrial, commercial, or pedagogical." He proposes the introduction of a modern course of study parallel with the lower section of the established secondary course and leading to an advanced section in which choice will be allowed between a commercial course and a technical course. In support of his proposal he cites the example of Switzerland. The rector of the national college, Mijia, in Quito, the highest type of secondary school in the state, urges, also, the institution of a technical and scientific course equivalent to the humanistic, and crowned, like the latter, with the bachelor's diploma. Thus it appears that the problems of secondary education in Ecuador are the same as those which have been agitating the principal countries during the last decade.

Quito is the seat of two normal schools, one for men, the other for women, of the national school of fine arts, of the national conservatory of music, and of the principal university (*Universidad Central*). This university comprises the faculties of law (course six years); medicine (seven years); pharmacy (five years); and science (three years). Students in the faculty of science who graduate with high honors may be sent abroad at government expense to perfect themselves in particular branches of science. The general plan of studies for the Central University is the same as for the two remaining universities, Guayaquil and Azuay.

A. T. S.

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EDESSA, SCHOOLS OF. — See CATECHETICAL SCHOOLS.

EDGEWORTH, MARIA (1767–1849). — The novelist, daughter of Richard Lovell Edgeworth (*q.v.*), was born at Black Bourton, fourteen miles from Oxford. She attended private schools, and, while her father remained in Ireland, spent her vacations with Thomas Day (*q.v.*), the great friend of her father, and author of *Sandford and Merton*. In 1782 Miss Edgeworth returned to Edgeworthstown in Ireland, where she spent the greater part of her life. For her brothers and sisters she began to write children's stories, at first without any idea of publication, and written down on a slate to be retained or not according to the approval or disapproval of her young audience. Such was the origin of the collections published under the titles of *Parent's Assistant* (first volume in 1796; in 6 vols. in 1800); *Early Lessons* (1801), *Moral Tales* (1801), and *Popular Tales* (1804). The first of these may be described as an appendix to *Practical Education,* in the production of which she had assisted her father; a work with a similar purpose in view of popularizing the educational theories contained in *Practical Education,* a modification of Rousseau's *Émile,* was *Harry and Lucy,* written by the father and daughter. These stories are didactic in tone, and aim to point some moral; the triumph of virtue and the downfall of evil form the central theme of the majority. They enjoyed a wide and long popularity, but the probability is that, except with very young children, they would now be found somewhat dull. Miss Edgeworth interested herself not only in the education of her brothers and sisters, to whom she was warmly attached, but along with her father paid no little attention to the education of the children on the Edgeworth estate. Lockhart, the biographer and son-in-law of Sir Walter Scott, in describing a visit paid to Edgeworthstown, says: " Here we found neither mud hovels nor naked peasantry. Here there was a very large school in the village, of which masters and pupils were, in a nearly equal proportion, Protestants and Roman Catholics, the Protestant squire making it a regular part of his daily business to visit the scene of their operations, and strengthen authority, and enforce discipline by his personal superintendence." The *Memoirs* of her father, which she edited, contain a good account of the educational theories and interests of her father, in which she undoubtedly shared. Her views on female education are contained in a very early work, *Letters to Literary Ladies,* written at her father's orders in 1795. This work was a defense of the education of women. It is interesting to note that her last work, *Orlandino,* as her first, was written for the amusement of children. Of her novels, all of which are intended to convey a moral purpose, it is not necessary here to speak; they met with immediate success, and for thirty-four years (*Castle Rackrent,* 1800, *Helen,* 1834), Miss Edgeworth remained actively before the public.

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EDGEWORTH, RICHARD LOVELL (1744–1817). — Author, experimentalist, and educational reformer; member of a distinguished family which, English in origin, had settled in Ireland in the reign of Queen Elizabeth. The training which he received from his mother during his childhood at Edgeworthstown greatly influenced his character and intellectual interests. His first instruction in Latin was received from a neighboring clergyman, Patrick Hughes, who had been one of the teachers of Oliver Goldsmith. In 1752 he was sent to Dr. Lydiat's school in Warwick, but afterwards to Drogheda School, which, under Dr. Norris, was then reputed the best in Ireland, and subsequently to a school at Longford. In his seventeenth year he entered into residence at Trinity College, Dublin, where he spent six months in idleness and dissipation. Consequently his father removed him to the University of Oxford, where he entered Corpus Christi College as a gentleman commoner in October, 1761. While still an undergraduate and under age, he married Anna Maria, the daughter of Paul Elers, a gentleman of German descent. Maria Edgeworth was a daughter of this marriage, which was not a happy one. At Hare Hatch, under the influence of *Émile,* he determined to educate his son according to the system of Rousseau (*q.v.*), and the result of the experiment continued for several years. It was during his residence at Hare Hatch that Edgeworth became an intimate friend of Thomas Day (*q.v.*), another admirer of Rousseau and subsequently the author of *Sandford and Merton.* Edgeworth also was admitted into the circle of scientific men then resident in Birmingham and the Potteries — Bolton, Watt, Darwin, and Josiah Wedgwood. He was also intimate with a brilliant society of literary and scientific men in London — John Hunter, Sir Joseph Banks, Maskelyne, Captain Cook, Smeaton, and Ramsden, the optician. In 1771 Edgeworth went with Day, for more than a year, to France, thus becoming intimate with French thought and feeling and with some of the intellectual leaders of French society.

Edgeworth was four times married, and had living with him a numerous family (four sons and five daughters, some grown up, some very young) by his different wives. After his fourth marriage, the two sisters of his second and third wives continued to reside with him. Nothing, however, clouded the affection which united this extraordinary household, in which every intellectual and public interest was keenly sustained, and in which all the circumstances and occupations of a brisk and happy family life were skillfully made use of in the work of education.

From 1782, as a resident landlord on his Irish estates, Edgeworth devoted much thought to the improvement of the condition of the poor upon his estate and in his neighborhood, and to educational reform as the surest means of increasing the security and happiness of the people. In 1788 the Lord Lieutenant had appointed Commissioners to inquire into all schools of public or charitable foundation and all grants or funds for the purpose of education in Ireland. The investigations of these commissioners drew public attention to the problem of national education. In 1799, as a member of the last Irish Parliament, Edgeworth moved: " That the state of public education in Ireland is highly defective and requires the interposition of Parliament; that one or more schools should be established in each parish; that the masters for schools should undergo examinations, obtain certificates of their conduct, etc., and be licensed annually by the diocesan; and that one or more visitors be appointed to inspect schools in each parish one or more times in each year." Leave was granted to introduce a Bill based on these resolutions, but it did not become an act of Parliament. After the Act of Union in 1800 (which Edgeworth believed would be ultimately advantageous to Ireland, but against which he voted in detestation of the means adopted in carrying it), Edgeworth was appointed, in 1806, by the Duke of Bedford, the Viceroy, to serve on a Board of Commissioners to inquire into the education of the people of Ireland. The Board, the members of which were unpaid, sat from 1806 to 1811. At the request of his colleagues on this Commission Edgeworth submitted a memorandum in which he outlined a policy for Irish elementary education. Many of Edgeworth's recommendations were adopted in 1831, when the Board of Commissioners of National Education in Ireland was established.

Edgeworth was intensely interested in the science and art of teaching and in the principles of education. " I claim for my father," wrote his daughter Maria, " the merit of having been the first to recommend by example and precept what Bacon would call the experimental method in education." He was assiduous in instructing the children of his own family, for whom he printed *Harry and Lucy*, the aim of which was to diffuse through a story the first principles of morality, with some of the elements of science and literature, so as to show parents how these may be taught without wearying the pupil's attention. Edgeworth was one of the first, after Dr. Watts and Mrs. Barbauld, to write books for children. His friend, Thomas Day, began his story, *Sandford and Merton*, as a contribution to Edgeworth's *Harry and Lucy*. The latter was subsequently published as part of his daughter Maria Edgeworth's *Early Lessons*.

In 1798, in conjunction with his daughter Maria, he published *Practical Education*, essays in which the influence of Rousseau's *Emile* is clearly shown. In 1802 Edgeworth published *Essays on Professional Training* (the first chapter of which gives his views as to the classification and curriculum of schools); and in 1816, *Readings in Poetry*. He also prepared with great labor a small tract called *The Rational Primer*, illustrating his method of teaching to read, which was based on the principle of always giving a distinct mark for each different sound of the vowels, and also showing by marks of obliteration which letters are to be omitted in pronouncing words. The educational works which he published in conjunction with his daughter had great influence upon school practice in England, and bore fruit in the work of Thomas Wright Hill (*q.v.*) and his sons in their school at Birmingham. Edgeworth was himself much influenced by the study of French writers on education. But he adopted no suggestions inconsiderately or without practical tests in his own family circle. He was one of the first to realize that educational theories must be founded upon child study and himself to form a careful register of facts relative to his children's mental growth. He held that early instruction should be chiefly oral and experimental. In the last twenty years of his life, additional experience changed some of his former opinions in education, and confirmed others. He was strengthened in his belief that " many of the great differences of intellect which appear in men depend more upon the early cultivating of the habit of attention than upon any disparity between the powers of one individual and another," though he latterly allowed that there was more difference than he had formerly admitted between the natural powers of different persons. In early life Edgeworth, shocked by the long lessons imposed upon young children and by the mental fatigue and disgust thus induced in them, did not pay sufficient attention to systematic grounding in elementary subjects. In later life, however, he was led to believe that some drudgery of mind was not only useful, but necessary for children, in order to train them to habits of application. He thought that girls should be privately educated at home; for boys he preferred school training, except in an uncommon coincidence of circumstances. In his earliest attempts at education (writes his daughter), Edgeworth had endeavored to reduce to practice Rousseau's theories. "Finding the bad effects which resulted from following the system, from trusting too much to nature, liberty, free-will and the pupil's experiments in morality, my father for some time afterward inclined to the extreme of caution. . . ." But Edgeworth's experience led him in later life to attach the greatest importance to the cultivation of right habit, under judiciously regulated freedom, as a necessary concomitant of the cultivation of the reasoning faculty as applied to conduct. Writing in 1812, he stated, on behalf of his daughter Maria and himself, that they were " convinced that religious obligation is indispensably necessary in the education of all descriptions of people, in every part of the world. . . . I consider religion, in the large sense of the word, to be the only certain bond of society."

His influence, combined with that of his daughter Maria, with whom he closely collaborated in thought and literary work, was strong in English and Irish education alike, both as regards methods of teaching in home and school, and as regards administrative plans of national education. In the improvement of methods of teaching, Edgeworth's practice reflected in the first instance enthusiastic acceptance of Rousseau's theories; then underwent the chill of reaction against them, and finally took the form of a judicious combination of Rousseau's realism and boldness with the moral discipline of the older educational tradition. Not less fruitful, though less immediately operative, was Edgeworth's influence upon the reorganization of the school system in England and Ireland. He was among the first to sympathize with the French ideal of a logically organized system of graded schools under state inspection, and no one was more successful in planting the seeds of this new administrative ideal in the reluctant soil of English statesmanship.

M. E. S.

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EDINBURGH ACADEMY. — See Grammar Schools, English; Colleges, English; Public Schools.

EDINBURGH HIGH SCHOOL. — See Grammar Schools, English; Colleges, English; High School; Public Schools.

EDINBURGH, THE UNIVERSITY OF. — Originally styled the College of Edinburgh, or The Town's College, was founded in 1583 by the Town Council of Edinburgh under general powers granted by the charter of King James VI, dated Apr. 14, 1582. From the first, the college possessed the privilege of granting degrees. In 1621 an act was passed by the Scots parliament which ratified to the college all the rights, immunities, and privileges enjoyed by other universities in the kingdom. This ratification was renewed at the union of the parliaments of England and Scotland in 1707. In the course of time, the college became known as the college of James VI, and later its designation changed, and the institution came to be called The University of Edinburgh; but it remained under the complete control and patronage of the town council until 1858, when by the Universities Act (1858) all the universities of Scotland received new and autonomous constitutions. From 1858 to 1890 the government of the university was vested in the *Senatus Academicus* (consisting of the principal and the professors), subject to the review and control of the University Court. The latter body is composed of representatives selected by postgraduates of the university, by present students, by the Town Council of the city, and by the *Senatus Academicus.* By the Universities (Scotland) Act of 1889 the constitution of the University Court was enlarged in numbers upon the already existing basis, and it was constituted a body corporate to which the whole property belonging to the university at the passing of the act was transferred with full powers of administration. The *Senatus Academicus*, as heretofore, regulates the teaching and discipline of the university, subject to the review and control of the University Court. The present constitution of the latter body is as follows: four members elected by the General Council of the University, which is composed of all graduates, four members elected by the *Senatus Academicus;* the Rector's Assessor, the Chancellor's Assessor, the assessor elected by the Town Council, the Principal of the University, and the Lord Provost of the City are *ex officio* members of the body.

The university buildings at present consist of (1) the College or University (old) Building situated on the site of "Kirk of Field," the scene of the murder of Lord Darnley. The foundation of the building was laid in 1797 on a plan drawn up by the famous architect, Robert Adam, but for various reasons, was not completed until 1828. In this building are housed, at present, the library and reading rooms of the university, the classrooms of the faculties of Arts, Divinity, and Law, and part of the work of the Faculty of Science. Here also are the Senate Hall and the various offices for carrying on the administrative work of the university. (2) The university (new) buildings, begun in 1878 and finally completed in 1888, at a cost of over a quarter of a million pounds. Here are now housed the lecture rooms and laboratories of the Faculty of Medicine. (3) The University Hall, situated adjacent to the new university and erected in 1897 through the munificence of Mr. William McEwan, a citizen of Edinburgh. The hall is used for graduation ceremonies and other university functions. (4) The Reid Hall of Music, erected in 1859, is also situated near the new buildings, and here is conducted the work of the Faculty of Music. (5) The Usher Hall of Public Health, situated in the south of Edinburgh, was given by Sir John Usher, Bart., on the institution of a Chair of Public Health in 1898, and completed in 1902. (6) New engineering and physical laboratories placed on a site at a short distance from the old buildings have recently been erected (1905–1907) in view of the modern demand for practical work in the teaching of these subjects.

The Inner Organization of the University. — Up to 1858 the education provided by the University of Edinburgh followed mainly the traditional lines laid down at its establishment. At that time the fortunes of the university had fallen to a low ebb. Graduation in arts had almost ceased, and degree courses in law and divinity did not then exist. By the act of 1858 a commission was appointed to remedy this state of matters. In due course they established a preliminary examination for entrance upon a medical course, and laid down regulations for degrees in medicine. Thus, there were established the three degrees of Bachelor of Medicine (M.B.), of Bachelor of Surgery (C.M.), and Doctor of Medicine (M.D.). For the doctor's degree the requirements were a lapse of two years after the possession of the lower degrees, and proof of having undergone a satisfactory course of general education in the Faculty of Arts. Under these regulations the number of students rapidly increased. The Commissioners next proceeded to frame regulations for degrees in arts, and as a result of their labors they established a one-degree course in this faculty. The subjects covered by this degree course were: Latin, Greek, mathematics, natural philosophy, logic, moral philosophy, and rhetoric (including English literature). At the same time they instituted honors degrees in classics; in mathematics and natural philosophy; in mental philosophy; and in natural science (including geology, zoölogy, and chemistry). The Commissioners next gave their attention to graduation in law, and in 1862 they laid down regulations for the degree of Bachelor of Laws (LL.B.), which was to be open only to those who had previously graduated in arts. This course, however, did not appeal to the public, for during the nine years after its institution (1862–1872) only twenty-four students were awarded the degree. Accordingly an agitation arose, which in 1874 resulted in the establishment of another and lower degree in law (B.L.) which could be taken by a student who had not previously graduated in arts. In 1864 the *Senatus Academicus* established a degree in the Faculty of Divinity, and also degrees in science in the departments of : (1) the mathematical science, (2) the physical sciences, (3) the natural sciences, and (4) engineering. It is to be noted, however, that at this time no separate faculty of science existed.

The next great change in the inner organization of the university took place in 1892. It was then enacted (1) that a preliminary or entrance examination should be incumbent upon all students entering upon a degree course in any existing faculty, and that the subjects of this examination should be English, Latin or Greek, mathematics, and one of the following, *viz.* French, German, Italian, or dynamics. This entrance examination was made common to all the four Scottish universities, and a joint board was established to control and regulate the examination. (2) In the second place, the universities of Scotland were thrown open to women students, and in Edinburgh women can now graduate in arts, in science, in medicine, in law, and in music. (3) The old seven-subject degree in arts had been found unsuitable in many cases, and moreover the exclusion of such subjects as history, political economy, and education from the arts course was regarded as an injustice. Accordingly, it was enacted that a student proceeding to graduation in arts must attend full courses in seven subjects, of which four must be (*a*) Latin or Greek, (*b*) English or a modern language or history, (*c*) logic or moral philosophy, (*d*) mathematics or natural philosophy. The remaining three courses were left to the choice of the student, subject to the condition that the group of seven subjects must include either (*a*) both Latin and Greek, or (*b*) both logic and moral philosophy, or (*c*) any two of mathematics, natural philosophy, and chemistry. In addition the subjects in which an honors degree could be already taken were extended so as to include such courses as modern languages and history. These regulations were made common to the four universities of Scotland. The other important change made was the establishment of a separate Faculty of Science. As a result of these innovations, the number of students in attendance at the university for a time gradually decreased, until the schools were enabled to raise their standard of scholarship to the new entrance test. Lectureships in French, German, geography, and other subjects were gradually established.

In 1908–1909 further changes were made in the arts course, with the view of widening the degree courses in this faculty. By ordinance, passed in 1909, it is laid down " that the curriculum for the ordinary degree in arts shall consist of *five* subjects of which two subjects shall be studied for two academical years, provided that it shall be in the power of the *Senatus* with the approval of the University Court to reckon courses in two cognate subjects as two courses in one subject." The effect of this new regulation is to give entire freedom to the university in the framing of courses of study in arts. In Edinburgh, the subjects in arts are grouped under four departments, viz.: The departments of (1) language and literature; (2) mental philosophy; (3) science; (4) history and law; and the only general regulation laid down for the construction of a degree course in arts is that subject to the approval of an official adviser appointed by the University Court, " every curriculum for the ordinary degree must embrace subjects taken from at least three out of the four departments of study enumerated above." The Faculty of Science has, as we have already noted, been an independent faculty only since 1893. In addition to the courses leading to a degree in pure science, degree courses are now also provided in the following departments of applied science, viz. (*a*) engineering; (*b*) agriculture; (*c*) public health; (*d*) forestry. The Faculty of Medicine, in addition to the degrees mentioned, now grants on conditions similar to the doctorate in medicine a master's degree in surgery (Ch.M.). In 1894 the Faculty of Music was established, and provides courses for students desirous of obtaining the degree of Bachelor of Music (Mus. Bac). Higher degrees are conferred on graduates on presentation and approval of a thesis in the faculties of Medicine, Science, Arts, and Music. Honorary degrees in divinity and in law may also be conferred. The total number of matriculated students in attendance during the year 1908–1909 was 3321, made up as follows: medicine, 1475 (including 35 women students); arts, 1157; science, 300; law, 305; divinity, 64; music, 20. Within recent years, the University of Edinburgh, in common with the other Scottish universities, has largely benefited from the grants received from the Carnegie University Endowment Fund. A number of new lectureships have been recently instituted, until at the present the number of professors and lecturers, exclusive of assistants to professors, numbers over a hundred. A. D.

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EDUCATION. — Speaking generically, education signifies the sum total of processes by means of which a community or social group, whether small or large, transmits its acquired power and aims with a view to securing its own continuous existence and growth. The necessity of education rests upon a few simple basic facts. These are the difference of level between the mature and the immature members of a society and the facts of birth and death. Since it is certain that all the mature members of a society will die, it is obvious that the conservation of a society depends upon rearing the newborn members in such a way that they will appropriate its functions and sustain its values. We may imagine a community in which the difference in grade of power and achievement between the immature and the mature is so slight that it will be bridged over in the course of the natural growth of the immature; such is the case, for example, with many of the lower animals. But in human societies, precisely the opposite is the case; the mere physical processes of growth, if not intentionally given a certain direction, do not secure the maintenance of the current habits and ideals of a social group. Failure to direct the natural processes would surely effect the extinction of all that is characteristic of the society. In other words, since the important institutions and purposes of a society are not physically hereditary, they must be maintained through a social heredity; that is to say, by the deliberate direction given to the natural capacities of the newborn by the already existent social forces.

The more primitive, savage, or barbarous a community, the less the difference of level between the mature and the immature, and the less important, relatively, the function of education. Savagery and barbarism mean that there is a comparatively slight departure in the social institutions from the results that would naturally be obtained by physiological development apart from social control — slight, that is, as compared with what is termed civilization, though great absolutely. The relative simplicity and meagerness of social life mean that less is at stake socially, so that there is less need of special supervision of the process of growth from infancy to maturity. Since every advance in the depth and richness of culture marks an increase in the difference of level between the mature and the immature, this constantly widening gap means increased necessity of education as the prime condition upon which the conservation of society itself depends.

This contrast leads us to our first fundamental distinction in education, that between formal and informal. In simpler social groups, the child becomes assimilated to the social activities and aims of his group by sharing, through play and work, in a constantly widening series of activities, in the life of those about him. He learns to do by doing, to share by sharing. Custom regulates the main details of life, and its rules are enforced in his conduct by imitation, suggestion, injunction, and prohibition with accompanying rewards and punishments. No *particular* social institution is required: the *school* does not exist as a specific institution of society. The child's natural associates are at the same time his sole teachers. At earlier and later puberty, however, there is something in the nature of more express instruction. There are in almost every tribal group special ceremonies of social commemoration and celebration; in connection with these, there are exercises for initiating the male members of the group into fuller social membership. Frequently these are quite complicated and last several weeks; they are so conducted as to impress upon the minds of the youths, under conditions of awe and intense vividness, the traditions and moral ideals of the group. There is also at an early period a certain amount of more specialized training for the calling of medicine man and priestcraft. As the arts of life, civil and military, became more complex, provision was made for them. The chief cause of the school as a formal institution was, however, the invention of letters. The symbols required special training for their mastery, while their existence permitted and encouraged the accumulation of knowledge far transcending the immediate environment, and hence not capable of acquisition through participating in the direct activities of the environment.

We are not, however, primarily concerned with the distinction between formal and informal education as a historic matter, but as a standing distinction of fundamental importance between out-of-school education and schooling. Children to-day, for example, get their initiation into and chief contacts with their mother tongue in their informal education; that is, they get it by partaking in certain forms of social life which exist on their own account, not for the sake of education. Other matters, technical science, algebra, and " dead " languages, are mainly relegated to formal education; many other topics lie partly in both fields. Many of the most important problems of educational theory and practice are determined by this situation. There are certain obvious advantages in the type of education that depends upon securing the educative result not by subject matter and method selected and arranged for the express purpose of education, but by actual direct participation in some form of contemporary life valued and performed on its own account. Genuineness, vitality, depth of interest and of assimilation, and consequent assurance of influence upon habit and character, are features of the incidental type of education. In contrast with these marks, school education tends to become remote and artificial (abstract in the unfavorable sense sometimes given that term), devoted to modes of technical skill and accumulation of knowledge with only a minimum effect upon character, because its affairs are not organized into the ordinary practices of daily life. Consequently, it is a constant cry of the educational reformer of each age that the school education has got too far away from the actualities of life to be genuinely educative. On the other hand, informal education, however deep, is almost sure to be contracted, since the environment in which an individual can directly share is limited in space and time. Moreover, its incidental character is favorable to its being incidental in the bad sense, *viz.*, casual and fragmentary. Many times the type of activity in which children would naturally take a part by direct sharing is relatively, if not absolutely, an unworthy type; moreover, since family and local environments vary tremendously, excessive reliance upon informal education tends to the perpetuation of class and even caste differences.

These considerations define the problem of formal education. First, the selection, with attendant criticism and rejection, of the social types and subject matter best worth perpetuating. Secondly, the widening of the usual or current environment through supplementing it with the subject matter and aims with which children would hardly come in contact in their usual family and neighborhood environments. Thirdly, the more systematic arrangement of the social subject matter with a view to securing the most economical coördination of its constitutive portions. In other words, conscious or deliberate education has to provide an environment (*q.v.*) (*a*) idealized or purified, (*b*) universalized, and (*c*) systematized, in comparison with that under which informal education goes on. At the same time, pains must be taken to avoid isolation of motive and matter, and to take advantage of the superior vitality and more intimate connection characteristic of informal methods. Every generation, in a society that is changing, has, to some extent, to work out this problem anew. For the shiftings of social activities change the domestic, and the industrial environment, and hence tend to exclude some factors of educational value from the direct environment and to introduce others. This means that the school must take some account of what the home and neighborhood are letting go, while they may correspondingly relax their attention to matters that are falling more within the scope of out-of-school experience. As the last two or three generations have seen an industrial revolution, which has already profoundly affected domestic and civic life, and as this has also been accompanied with a tremendous cheapening of literary or printed matter and a corresponding increase in its accessibility and ease of circulation, the problem of the proper adjustment of school and out-of-school education is at once more urgent and more serious at the present time than at any previous epoch.

I. A return to the original definition will now serve to bring out the essential phases of education; they are the social-ethical, the biological, and the psychological. The starting point and the aim are both clearly social. Societies, social groups, with their equipment, their traditions, their purposes, always exist, and are, so to speak, in possession of the field. They aim at their own perpetuation; they will not knowingly permit the introduction of anything destructive of their own most cherished aims; and they will insist upon ideals of subject matter and method that seem indispensable to their own continuity of being. We must not, however, be misled by the simplicity of the words, society and social group, into overlooking the very great complexity and diversity of the facts to which these words refer. Any modern state (the United States, perhaps, to a greater extent than any other) is a congeries of communities within communities, of social groups of differing religions, moral traditions, cultural equipments, economic differences, etc. In a modern complex democracy the burden of finding a common denominator amid these differences falls upon the public school system more than upon any other one agency: a fact of great significance in connection with the rapid development of a nationalized and secularized education in the last century. It may be doubted whether any scheme can be devised as well calculated for getting the benefit of the diversity of factors and at the same time avoiding the attendant dangers of centrifugal divisions as is the public, secular system of universal education. But in any case a glance below the surface will show that at all times social considerations have been the controlling considerations in educational systems, and this as regards not merely their institutional forms, but their subject matter and method of study as well.

Social.

The biological factor comes into full view as soon as we consider that the necessity of education is due to the existence of immature beings who are to be directed in their growth. The conservation of social values is to take place through individuals who are born helpless, but with certain structural capacities and with certain urgent or impulsive tendencies which manifest themselves in accordance with biological principles. In other words, education, from the side of the beings to be educated, is a matter of taking an animal being whose activities are primarily upon the biological plane and transforming them into functions that operate upon the social plane. Since the values to be transmitted have to be perpetuated through the medium of those whose activities are naturally upon a different plane, the problem of effective and economical education is identified with the problem of discovering the native, or biological, equipment which lends itself most easily and fruitfully to effecting the type of growth desired. Hence the constantly increasing attention in modern educational theory to the nature of infancy and its prolongation, to the biological study of instinct and impulse in the child, and to all the physiological problems of normal, retarded, and abnormal growth. Even details of brain anatomy and of school hygiene get a profound meaning when looked at from this point of view.

The psychological phase of education has to do with the biological factors functioning under conditions of social control for the realization of social ends. In other words, only social psychology is of primary importance for education. However it may be for other purposes, from the standpoint of the *educator's* interest and problem, " mind," " consciousness " denote the natural capacities of the individual as these become available for social uses and are saturated with social contents. Memory, for example, is a certain biological capacity of retentiveness, shaped with a view to creating socially available habits. Perception, from the educational point of view, is not a bare mental faculty face to face with a purely physical world; it is the capacities of eye, ear, touch, etc., trained to take account of the conditions that are of social importance, and to do so in accord with the values socially attached to those objects. The extreme individualism of much of modern pedagogy is itself a symptom of a certain social fact back of it. Only because modern society is democratic (that is, makes much of the notion of the freedom and relative equality of its members) are initiative, independence, freedom of action and thought, important as educational aims. Hence, at bottom, the psychological strain in modern educational theory and practice presupposes the context of a democratic society in which the individual is to live. The aim is not to understand individuality in the abstract, but to understand individuality with reference to forming and cultivating those traits of character by which the democratic social medium sets store.

II. So far we have considered education from the standpoint of its place and function in societies that make use of it to secure the conservation and expansion of their own ideals. We may, of course, also regard the process from the standpoint of the immature beings who at a given time are being transformed into social members, to sustain the community type of life. So viewed, education may be defined as a process of the continuous reconstruction of experience with the purpose of widening and deepening its social content, while, at the same time, the individual gains control of the methods involved. (See Form and Content.) That is to say, from the standpoint of the one educated, the beginning is at the biological end, not the social. Experience is crude, narrow, and largely self-centered. Yet it has within itself capacities of assimilating and re-creating what is most perfected, developed and generalized in culture, for otherwise the wonderful products of art, industry, and science would never have come into being as in the past. Hence the educative process is a constant process of making over the existing experience, so that the social values lying blindly and crudely within it shall be clarified and enlarged. Yet the leverage of this transformation must be sought and found within experience itself; experience cannot be made over from without, but only in the process of its own growth. There are dynamic, transitive tendencies in the very nature of experience which tend to keep it growing and expanding. The educational process provides stimuli that appeal to these intrinsic tendencies. That this making over involves not only an increase in the socialized contents of experience but of self-control is evident in the fact that the stimuli provided by the educator must not work to develop dependence upon foreign supports. On the contrary, while it is true that one can never dispense with stimuli to action and growth, yet a genuinely educative growth always puts it more in the power of the individual to search out the conditions needed for his own further growth. When he has attained this power, schooling ceases. In assimilating into his own experience social subject matter he must do it in such a way as also to master the tools and technique of social progress. So far as this happens, a balance is preserved between the social and the individual, or psychological, aspects of the education of the pupil. There are systems of education which succeed in saturating the pupils with social subject and with loyalty to social aims, but that afford little power of personal control in the reshaping of experience. There are others that yield excellent gymnastic training of isolated individual powers, but that furnish only a slight modicum of socially important content. (See Formal Discipline.) But according to our definition, in order to be genuinely educative both results should be simultaneously accomplished.

Historically considered, it is not surprising to find that classic Greek definitions of education emphasize the social aim and the social character of the subject matter, with some tendency to subordinate the individual or psychological side, or at least, to take individual capacity as a pretty definitely fixed thing; that the Renaissance definitions alternate between emphatic assertions of individual claims and equally emphatic recognition of the claims of the new nationalities that were springing up amid the passing away of feudalism; that the typical eighteenth century is individualistic on one side and cosmopolitan on the other; while nineteenth-century conceptions at first perpetuated the notion of "harmonious and complete development of all the powers of the individual," and then reacted to social definitions conceived sometimes in a nationalistic spirit (patriotic citizenship), sometimes in terms of industrially efficient service, and sometimes in a somewhat broad and vague philanthropic spirit. At the present time, "social efficiency" is probably the favored phrase. Social efficiency may, however, be taken in a narrow and external way, or in a broader and more liberal sense. In the former, social efficiency is supposed to be measured on the basis of definite output of overt acts and external products, with little attention to their reaction into the individuals' appreciation of the meaning of these acts and commodities. To be doing something is set over against the enrichment of consciousness at the expense of the latter. In the truer and more generous sense, social efficiency means also increase of ability to share in the appreciation and enjoyment of all values of social intercourse, and thus necessarily includes the enriching of conscious experience.

From whichever side education be defined, whether from that of the community carrying it on or that of the individuals educated, it will be found to involve three factors, which may be distinguished but not separated. These are (*a*) the specific institutions which are differentiated for the special work of education; (*b*) the subject matter (see Course of Study), and (*c*) the typical methods of discipline and instruction employed to realize the ends in view. J. D.

See Adjustment; Character; Experience; Formal Discipline; Form and Content; Liberal Education; Moral Education; Philosophy of Education, etc.

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EDUCATION, ACADEMIC STUDY OF. —

In this article consideration is given only to the organized work in higher institutions of learning. The practical or professional consideration of the study of education is treated under the caption Teachers, Training of. Some attention is also given to the same aspect of the subject in the various articles on the national systems, especially that of Germany, under the subtitle Training of Teachers. The scope and method of the scientific study of education is more fully considered in the articles on Experimental Pedagogy; Experimental Schools; and Research in Education. The content as well as the development of the special phases of the study of education is given under the titles, History of Education; Philosophy of Education; Psychology, Educational, etc.

England. — The opportunities for the study of education in England are of comparatively recent origin. In the field of secondary education tradition, a narrow curriculum, reliance on experience rather than training, the confidence placed in the teaching ability of the scholar as such, were some of the factors which militated against professional studies; while in elementary school work the apprenticeship system prevailed until a few years ago. In 1825 there appeared a *Plan for carrying into effect the Objects of the Society for Promoting the Science of Education*, by Mr. Davenport, but little more was heard of the project. From 1837 to 1839 existed the Central Society, which aimed at "ascertaining the objects of education and determining the means of attaining them . . . and to give the theory of education a more scientific character than it has yet assumed."

In 1848 a series of public lectures on education was organized to propound the views of the Congregational Board of Education, which favored voluntary effort in education as opposed to government intervention (see *Crosby Hall Lectures on Education*, London, 1848). Probably the earliest attempt to promote the study of education among teachers was made by the College of Preceptors, established in 1846 and empowered by its charter to " institute lectureships on any subject connected with the Theory and Practice of Education." In 1861 began the series of monthly meetings in London, at which prominent scholars and teachers delivered lectures on educational topics, but unfortunately the audiences only numbered from two to sixteen members. The first examination in the theory and practice of education was held in 1867, and twenty-four candidates passed. In 1873 the College established a professorship of the science and art of education, the first of its kind in England, followed in 1876 by the establishment of the Bell Professorships of Education at the Universities of Edinburgh and St. Andrews. Regular courses of lectures have been given since that time, and a special course is given in January at the winter meeting of the College. In 1895–1898 a training department for secondary teachers was conducted. In his *Report to the Schools Inquiry Commission on Schools in the West Riding of Yorkshire* (1868), Fitch strongly recommended the establishment of a professorship of pedagogy in one of the universities, and of degrees in education. The Headmasters' Conference in 1872 and subsequently also urged the universities to remedy the defect and provide for the study of education. Considerable pioneer work for the promotion of the study of education was done by C. H. Lake, Joseph Payne, Thomas Hall, Robert H. Quick, Joshua Fitch, and others. The Education Society, or the Society for the Development of the Science of Education, was founded in 1875 with an ambitious program, which, since it may well be adopted at the present period, is here given in full: to collect and classify educational facts; to discuss educational problems on a definite plan, and to arrange and record facts; to give lessons and discuss the principles involved; to examine and report on educational machinery; to get acquainted with educational ideas abroad; to examine and criticize the labors of eminent educationists; to examine the lives of eminent men; to consider the educational influences (conscious or unconscious) affecting their careers and to investigate the educational forces at work; to publish proceedings. Papers were read and lessons were given and criticized, but the influence of the Society among the rank and file of teachers was not great. In 1887 the Society was merged with the Teachers' Guild. From 1878 .there has been a gradual increase in the number of training colleges for teachers, beginning with the establishment in that year of the Maria Grey Training College in London, for women; in 1879 the Teachers' Training Syndicate was appointed at Cambridge to organize courses in the theory and practice of education, and in the same year R. H. Quick was appointed to deliver a series of lectures on education at that university. In 1883 a teachers' diploma examination was instituted by the University of London. In 1890 the establishment of day training colleges in connection with the universities paved the way to some extent for the recognition of education as a university study. The opportunities for professional study were rapidly increased after 1894, when the special preparation of secondary teachers was recommended by the Bryce Commission, and became the logical outcome of the proposals for a teachers' register and the Education Act of 1902, which placed secondary education under the control of the central board. Courses in education both for elementary and secondary teachers are now found in most of the universities under the charge of a professor of education. There seems some indecision at present as to the faculty under which such courses should be placed, since both science and art students may take education toward their degrees. In the universities of Manchester, Liverpool, and Sheffield, for example, the instructors in education belong to both the faculties of arts and science; in the Scottish universities education is part of the faculty of philosophy. In no case, however, is there a separate faculty of education, nor is there any provision for degrees in education or pedagogy. A chair in this subject does not exist as yet at Oxford, where a reader is at the head of the work, or at Cambridge, where there is a lecturer. Students who prepare for teaching in secondary schools take the study of education as postgraduate courses. A few summer courses in education are offered, those at St. Andrews University and Oxford being the most prominent. The requirements for diplomas and certificates in education, which will give the best indication of the scope of educational study, include some or all of the following subjects: history of education; psychology, logic, and ethics; observation of children, and child study; school hygiene; principles of education; principles of teaching; school organization, discipline, and management; method. As a general rule most of the courses here given are accessible to students in day training colleges giving preparation for elementary schools.

The following courses may be taken as representative: —

MANCHESTER UNIVERSITY .— *The Mental and Physical Life of School Children.* — The course will consist (*a*) of lectures offering an elementary introduction to genetic psychology, combined with (*b*) observation of children and other practical exercises in schools. In the Lent term, School Hygiene (five or six lectures).

Scientific Principles of Teaching. — (1) The curriculum, especially with reference to the elementary school. (2) General principles of method, including the study of lesson notes. (3) Special method in the pursuit of individual branches of the curriculum. *Systematic Review of the Principles of Education*, including a study of the corporate life of schools and of school management. Michaelmas term. Selections from the History of Education. Lent term, *The Observation of Children and School Hygiene;* demonstrations, practical work, and lectures. *The Pursuits of the Infant School.* Observation, lectures, and demonstrations. *Selections from the History of Education,'* bearing especially on the teaching of young children. *Lectures*, with demonstrations, on the organization and management of secondary schools, on periods in the History of Education, and on educational statistics.

Sheffield University.— I. *History of Education:* (*a*) the educational reformers of the eighteenth century, with special study of Rousseau's *Émile;* (*b*) English education during the nineteenth century. II. *Theory of Education:* (*a*) the meaning of education; (*b*) the aim of education as determined by the consideration of (1) personality, (2) society; (*c*) the process of education as determined by (1) mental development, (2) the need of equipment for practical life, (3) the value of the subjects taught, (4) the organization of schools and classes. III. *The Practice of Education:* (*a*) the general principles underlying method in teaching; (*b*) the methods of teaching particular subjects, with special reference to those which students are going to teach; (*c*) organization; (*d*) school hygiene.

Advanced study of education in England is only in its initial stages. Up to the recent years Germany was still the Mecca of the educationalist, but there are signs of a growing activity at home, particularly along the lines of relating the results of experimental psychology with education. But unfortunately a good deal of the work in this field is done privately, in the sense that no university funds are placed at the disposal of the students. In London the University College offers facilities for research along psychological lines. The department of education in the University of Sheffield is provided with a small psychological laboratory, which is maintained by the university authorities. At Edinburgh University, students in training must take a term's work in the psychological laboratory, and the new training college is to contain a laboratory. The Teachers' Guild has formed a research committee which receives and discusses abstracts from psychological journals and assists in the prosecuting of research in the schools. But a good deal of the work of this type which is gradually finding its way into most universities is individual and unorganized, and there is some danger of duplicating not only English experiments, but a considerable amount of the work already done elsewhere. The question of educational research formed the subject of a report in Section L of the British Association at its 1910 meeting, in which the committee not only pointed out the need of funds for the furtherance of educational research, but referred to the progress made by other countries as compared with England. The *Training College Record* has recently begun to devote space to experimental pedagogy and is now published as the *Journal of Experimental Psychology and Training College Record.*

In addition to the means for study already referred to, the work of associations, such as the Child Study Association, should be mentioned. Several good pedagogical libraries are accessible to students in London at the Board of Education, at the Teachers' Guild, and at the College of Preceptors.

Scotland. — Professor James Pillans, Professor of Humanity in the University of Edinburgh, and author of *Lectures on the Proper Objects and Methods of Education*, had urged the establishment of chairs in education in at least two of the Scottish universities in 1828, and was so encouraged at the reception of the proposal as to repeat it in 1834 and suggest chairs in each of the four universities. At its preliminary meeting in 1847, the Educational Institute of Scotland, a body composed of members interested in education, recommended a wider dissemination of the theory and practice of education, and like the similar body in England, the College of Preceptors, arranged for a course of lectures in Edinburgh in 1847–1848. In 1851 the Institute produced a scheme for lectures in the theory and practice of education, but was without funds to put it into operation, but the organization constantly pressed for the establishment of professorships in education, and sent a memorial to the university commissioners in 1859. The appearance of a strong article on the subject in 1862 in the *Museum* encouraged Professor Pillans once more to put forward his scheme and to that end he interviewed Mr. Lowe, vice-president of the Education Department, on the subject, only to be told that there was " no science of education." From 1873 onward the matter was taken up in the press, *e.g. Fortnightly Review, The Schoolmaster, Scotsman, Courant, Daily Review, Glasgow Herald.* In 1876 the Bell Chairs of Education were established in the Universities of Edinburgh and St. Andrews, but for a long time the academic recognition of the subject was slight. Lectureships in education were established much later at Aberdeen (1893), and at Glasgow (1894). No degree is conferred in education, but the subject is accepted as a qualifying subject for the M.A. degree.

France. — The first public course of education in a university faculty was established at the Sorbonne in 1883 for M. H. Marion (*q.v.*), a " lay Fénelon," whose views have profoundly changed the educational traditions of France.

He occupied the chair until his death in 1896. He directed practical conferences at which the students discussed the best methods of education (see *Revue Internationale de l'Enseignement*, 1883 and 1896). This first organization served as the prototype for present practice. In 1884 educational conferences were organized at Lyons by M. R. Thamin, now Rector of the University of Bordeaux. Some irregular attempts to introduce the study of education were also made at Bordeaux by M. Espinos in 1882. At Toulouse M. Compayré lectured in 1875 on the history of education and on child psychology in 1879.

At present regular conferences or a course in education exist in all the universities, in which students prepare for one of the *agrégations* in secondary education. (See France, Education in.) Since 1906 all candidates for different *agrégations* must study pedagogy at the same time as they are pursuing the courses for their *agrégation*. In the first year they take a theoretical course, given at Paris by M. Durkheim, at Lyons by M. Chabot, at Bordeaux by M. Richard, at Montpellier by M. Foucault, at Grenoble by M. Dumesnil, etc. Such courses deal generally with the history and theory of secondary education, the psychology of the pupils, the evolution of the intellectual faculties of the child, the rights of children, social pedagogy, etc. These theoretical courses are nearly everywhere accompanied by other conferences conducted by specialists on school hygiene, training of the memory or attention, etc., defects of vision or hearing among pupils. The first part of the pedagogical course is intended to give general principles. In the succeeding year the candidates for the *agrégation* attend courses on special methods, and, before entering on their preparatory stage at a lycée, must attend a series of conferences on the best methods of instruction in the subject in which they expect to attain their *agrégation*. At Paris the rector, M. Liard, who was the first to organize this course, holds the opening conference in person, while the rest are given by the most qualified professors, *e.g.* M. Croiset in letters, M. Lavisse in history, etc. They deal with the teaching of literature, grammar, philosophy, history, geography, modern languages, mathematics, natural and physical sciences. These courses and conferences are at times attended not only by the candidates for the *agrégation*, but, as at Lyons, Grenoble, Montpellier, etc., by professors, teachers, and mistresses in the boys' and girls' lycées, whenever possible. A diploma is given at Lyons to those students who produce an interesting and original work on the subject matter of the courses. (See France, Education in; Teachers, Training of.) J. P.

Germany. — The first attempt to give a professional education to teachers of the higher schools is due to J. M. Gesner (*q.v.*), who founded (1734) a *Seminarium Philologicum* at the University of Göttingen, in which candidates of theology were prepared for their work as school teachers. Their pedagogical study was based on Gesner's *Institutiones rei scholasticæ*, an exposition of the principles of Ratke, Comenius, and Locke, and was supplemented by practice lessons in the Göttingen schools. A considerable impetus was given to the study of education in several of the Prussian universities through the efforts of Zedlitz (*q.v.*), the minister of Frederick II. He, being an admirer of Basedow and his Philanthropinum in Dessau, called the philanthropinist, E. C. Trapp (*q.v.*), to the University of Halle as professor of pedagogy and director of the pedagogical seminary (1779). Trapp's work in Halle was a failure, and he was succeeded (1782) by Fr. A. Wolf, under whom pedagogy was soon entirely supplanted by philology.

At the University of Königsberg, Zedlitz arranged to have the professors of the philosophical faculty take turns in lecturing on pedagogy (1774). In this way Kant (*q.v.*) gave four courses on pedagogy the first time in 1776, taking as a basis Basedow's *Method-book*, for which he later on substituted Bock's *Lehrbuch der Erziehungskunst* (Königsberg, 1780).

In a few other universities lectures on pedagogy were delivered and pedagogical seminaries founded, as in Helmsted, Heidelberg, and Kiel. The pedagogical Seminar at Heidelberg was conducted by F. H. C. Schwarz, the historian of Education. His announcement published in 1807 (*Einrichtung des Paedagogischen Seminarium auf der Universität zu Heidelberg*) sets forth a very modern course for the two years, including pedagogy, didactics, catechisation and method for schools and other educational institutions, and history of educational institutions and literature. The students wrote essays on assigned topics, gave accounts of their own experiences and observations at school visits, and acquired some practical experience. The real introduction of pedagogy as a university study is due to the activity of Herbart (*q.v.*), Kant's successor in Königsberg. The pedagogical seminary, which he established in 1810 and directed until he left Königsberg in 1833, became the model of other important institutions of this kind. In 1843–1845 Gustav Thanlow, a disciple of Hegel, conducted a pedagogical seminar and lectured on the philosophy of education at the University of Kiel. (See his *Nothwendigkeit und Bedeutung eines pädagogischen Seminars auf Universitäten;* and *Erhebung der Pädagogik zur philosophischen Wissenschaft oder Einleitung in die Philosophie der Pädagogik*, Berlin, 1840.) Brzoska, one of Herbart's pupils, carried the idea of a pedagogical seminary to Jena, where, after his early death, it was put into execution by K. V. Stoy (*q.v.*), and afterwards (from 1885 on) by William Rein, who still holds the professorship of pedagogy and directs the pedagogical seminary and the practice school connected with it. In like manner, another follower of Herbart, T. Ziller (*q.v.*), worked in Leipzig, where (in 1862) he established a pedagogical seminary which he directed until his death (1882). The work of Strümpell in Leipzig is confined to theoretical pedagogy, while that of other professors, such as Hofman in the same university, of Ziegler in Strassburg, Uhlig in Heidelberg, Schiller in Giessen, extends also to observation and practice teaching.

On the whole it may be said that the great interest in the study of education, and the care for the professional training of the teachers of the higher schools, which was very prominent towards the end of the eighteenth century, later on in the universities gave place to a certain contempt of pedagogy. It was assumed that, if the teacher was a thoroughly trained scholar in his specialty, be it philology or science or mathematics, the ability of imparting his knowledge to young minds would follow of itself. More recently, however, the importance of a theoretical and practical training in the science and art of education is becoming more and more recognized.

As organized at present, the academic study of education is incorporated for the most part into the work of the *Seminarjahr*, which is required of all prospective teachers in secondary schools, and is organized under the direction of selected secondary school directors. And in addition to this the traditional seminar work of the university for the year preceding the *Seminarjahr* has been directed largely to the academic training of these prospective teachers. The work in direct connection with the universities is largely theoretic and has been becoming gradually of less and less importance, while on the other hand the term *Seminar* is being applied now almost wholly to this practical work of the *Seminarjahr* under the control of the directors of important secondary schools. At the present time there are about seventy such designated schools in Prussia, each being responsible for eight or ten students per year. The work of these seminars, which is based upon a thorough mastery of the appropriate subject matter, consists in a study of the theory and practice of education in relation to the higher schools under the supervision of the school directors, together with practical observation in one of the higher schools, to which they are assigned in groups of eight or ten. Here twice a week discussions occur upon all sorts of theoretical and practical questions which arise out of the work of the school. Such discussions necessitate investigation and study of the kind which formerly in Germany and elsewhere now would usually be organized into university courses of instruction. This work is fully described in the article GERMANY, EDUCATION IN, in the section on Training of Teachers. (See also TEACHERS, TRAINING OF.)

For this reason the formal study of education in the universities as an independent academic subject has little place. There is only one special professorship in education at the present time, and only recently the Bavarian authorities refused to sanction the establishment of special chairs in education. However, some courses on the subject are usually offered in most universities. Ample provisions are made for the study of psychology, pure and experimental, of philosophy, logic, and ethics. Such courses in pedagogy and history of education as are found are given by the professors or docents in the faculty of philosophy. The fullest courses in these subjects are found at Leipzig, where the preparation is given for teachers in the higher schools of Saxony. These include history of education, modern educational problems, introduction to theory and principles of education with practical work, physical education, and method. Only one university, Jena, has a recognized practice school. At Leipzig use is made of the local higher schools for practical work and observation. Göttingen and Kiel also announce pedagogical seminars, but for the present they are in abeyance. But the facilities at the universities are inadequate, for the reason that the professional preparation of teachers is not part of the work of these institutions. Advanced study of education is stimulated in lower schools, at any rate, by the necessity of meeting the standards of promotional examinations. For the special training of normal school teachers and some administrative officials a special course (*wissenschaftliche Fortbildungskurse*) has been established in Berlin, including educational subjects. Much professional activity is shown by teachers' associations and in individual study and experimentation. At Leipzig the Teachers' Association established an important institute for experimental pedagogy and psychology (*Institut für experimentelle Pädagogik und Psychologie*), and in Munich a plan for a similar institute (*pädagogisch-psychologische Institut*) was drawn up in March, 1910. School museums and good educational libraries, especially in Berlin and Leipzig, offer excellent opportunities for research.

In the following table a list is given of the courses announced in the German universities for the winter semester 1910–1911. Only those courses which are specifically educational are mentioned, without any reference to courses in ethics, philosophy, and pure psychology, which are found in all the universities.

EDUCATIONAL COURSES IN GERMAN UNIVERSITIES

Winter Semester 1910–1911

(Figures in brackets denote number of hours per week)

Berlin.
- Diseases of School Children. (1)
- Teaching of Modern Languages. (2)
- Principles of Secondary Education. (1)
- Experimental Pedagogy. (2)
- Experiments in the Psychological Institute. (3)
- Conference on Recent Research in Experimental Psychology. (2)

- Bonn.
  - Herbart, Seminar. (2)
  - Experimental Psychology Practice.
  - Pedagogy. (2)
- Breslau.
  - Psychology of Adolescence. (2)
- Erlangen.
  - Rousseau's Philosophy and Pedagogy. (1)
  - Topics from the History of Education. (2)
- Freiburg-i.-B.
  - Educational Psychology. (2)
  - School Hygiene. (1)
- Giessen.
  - Psychological Statistics.
  - Introduction to Experimential Pedagogy. (1)
  - Educational Psychology. (2)
  - History of culture and education since the Renaissance. (2)
  - Outlines of the theory and method of education. (2)
- Göttingen.
  - Experimental Psychology.
- Greifswald.
  - History of Psychology. (1)
- Halle.
  - Educational conferences.
  - History of the Prussian School System.
- Heidelberg.
  - History of Education and Educational Theory. (2)
- Jena.
  - Survey of the History of Modern Education. (1)
  - General principles. (4)
  - Seminar and practice-teaching. (5)
- Königsberg.
  - History of Education. (4)
  - Introduction to Child Psychology and Experimental Pedagogy. (Daily)
- Leipzig.
  - History of Education. (4)
  - Modern Educational Problems.
  - Educational Psychology Seminar. (5)
  - Introduction to Theory and Principles of Education. (2)
  - Seminar with Practice-Teaching in Mathematics, Science, French, and English. (4)
  - History of Education. (3)
  - Theory and Principles of Physical Education.
- Marburg.
  - General Principles. (3)
  - Practicum in Education. (2)
  - Introduction to Experimental Psychology. (2)
- Munich.
  - Introduction to Experimental Psychology. (4)
  - History of Education. (2)
- Münster.
  - The Mutual Relations of Philosophy and Education in the Last Century. (2)
- Tübingen.
  - Theory of Education. (3)
  - Practice of Education. (1)
- Würzburg.
  - Practicum on Herbart. (1)
  - Practicum in Experimental Pedagogy. (2)

See GERMANY, EDUCATION IN; TEACHERS, TRAINING OF.

UNITED STATES. — Although the opportunities and facilities for the scientific study of education are far better and more complete in this country than in Europe, their history does not go further back than a quarter of a century. Indeed, it may be said that a proper conception of what the study of education should stand for has only been formed within the last few years. Remarkable prevision was, however, shown by the faculty of Amherst College as early as 1826. Their report presented on Aug. 21, 1826, to the board of trustees, in which they recommended the introduction of a system of electives, contained these significant proposals: "But whatever may be thought of these suggestions, there is one new department of great practical importance which it appears to us should be annexed to the college, as soon as the funds will anyhow permit — we mean the *Science of education*. When it is considered how this lies at the very foundation of all improvement . . . it is truly wonderful to us that so little attention has been bestowed upon the science of mental culture, and that there is not . . . and never has been, a single professor of education on this side of the Atlantic." A new system of "equivalents" was introduced in 1827, but the science of education formed no part of them.

Important work was done for a period extending over nearly twenty years (1823) by Rev. Samuel R. Hall, the founder of the first normal school in the United States, at Concord, Vt. (1723-1830). In 1830 he removed to Andover, and there opened a teachers' seminary to educate teachers and others. While only the common branches of school education were given, there was a special course in the art of teaching; in 1835 there was a professor in natural science and the art of teaching, and the course of study was announced to be more professional. In 1837 Hall moved to Plymouth, N.H., where he also opened a teachers' seminary and himself gave fifty lectures on the art of teaching each year. When he moved to Craftsbury, Vt., in 1840, he added a teachers' department, which he conducted up to 1846. Hall was the author of the *Instructors' Manual and Lectures on Schoolkeeping* (Boston, 1829), which, according to the *Annals of Education* stood alone as a book on principles of education amidst the ever increasing number of school textbooks. In 1831 a professorship of education was established at Washington College in western Pennsylvania, according to a record in the *Annals of Education*, Feb. 1831, p. 82. In 1838 weekly lectures were given before the Massachusetts Board of Education, among others, by Horace Mann, James G. Carter, and Rev. Charles Brooks. But generally the demand of this period, which may be followed in the volumes of the *Annals of Education*, was for the provision of professional training of common school teachers rather than for higher study of education. (For further details see TEACHERS, TRAINING OF.) In most cases the colleges and universities were compelled by the demand of their students and the insistence of those who recognized the inefficiency of secondary school teachers to provide some means of acquiring a slight professional training before their entrance into the secondary schools. It was obvious that a large number of college graduates had devoted themselves to the teaching profession, and that the number of these would necessarily increase with the multiplication of high schools. The slow progress made at the beginning was due, as in England, to a feeling that education did not offer a field of study, that experience was the best type of professional training, that, if such work had to be done, the normal school, and not the college or the university, was the place for it. But in spite of contempt and ridicule, lack of encouragement and inadequate equipment, education, at first assigned a subordinate position in a faculty of philosophy, was gradually provided with a professor, became established in a department, and later in a college with separate buildings, faculty, and administration.

With the opening of New York University (then called University of the City of New York) in 1832 there was established a chair of the philosophy of education for "educating teachers of common schools." Thomas H. Gallaudet (*q.v.*) filled the post during the collegiate years 1832 to 1834. This was probably the first effort made in the United States for the special preparation of teachers of common schools, and certainly the first of such work in college. In his *Seventh Annual Report* (1842–1843) Horace Mann urged the necessity of the proper preparation of teachers. "Why," he asked, "should we require a lawyer or physician to study his profession, and let the teacher . . . go unacquainted with his business?" When called to the presidency of Antioch College in 1853, he introduced a course in education. In 1850 the recommendations of President Wayland (*q.v.*) of Brown University for a course of instruction in the science of teaching was accepted, and S. S. Greene of Boston became the first professor of didactics at this university; but the chair was abolished in 1854 owing to lack of funds. The students who desired the subjects connected with it were advised to go to the Rhode Island Normal School at Providence. An abortive attempt was made to introduce the study of education in Missouri University in 1877. At the State University of Iowa a chair of Mental Philosophy, Moral Philosophy and Didactics was established in 1873, when the provision of instruction in education had been advocated for thirteen years (from 1853). Sporadic attempts to provide facilities for college courses in education were made throughout this period. Thus B. A. Hinsdale lectured on teaching at Hiram College each fall term from 1870 to 1882, continuing a custom introduced in President Garfield's time in 1856. At Michigan University the Superintendent of Public Instruction, Dr. John M. Gregory, voluntarily offered his services in 1860 to give courses in the principles and philosophy of education, organization, management, and instruction of schools. He gave two lectures a week, which were attended not only by the college seniors, but also by members of the law and medical schools. But in 1879 a chair devoted to the professional training of teachers was established at this university by President James B. Angell, who had been at Brown University under President Wayland. W. H. Payne was the first professor of the Science and Art of Teaching. At Columbia University President F. A. P. Barnard strongly advocated the professional education of teachers in the annual reports of 1881 and 1882, and it seems highly probable from his correspondence with Henry Barnard that an unsuccessful attempt was made at this time to secure the services of Professor S. S. Laurie of Edinburgh. This proposal led to the establishment at this university of a course in philosophy of education, which was later to be merged in Teachers College. Since that period chairs, schools, departments, and colleges devoted to the study of education have been established in most of the larger colleges and universities, and few of the smaller colleges have failed to provide some courses in education, however inadequate these may be.

Within the last ten years there has been a rapid increase in the provision of chairs of education and in the establishment of schools and departments of education or in the separation of these out of other departments. Thus in 1901 the University of West Virginia founded a department of education; in 1902 Missouri University obtained a teachers' college; in 1905 the University of Virginia established a school of education; similar establishments followed in other institutions. At present many, if not most, of the institutions bearing the title of college give courses in education, in many cases no better than, and in some cases inferior to work in normal schools. But in the better institutions the education departments not only meet the demand for trained teachers in high schools, but provide opportunities for research based on scientific methods. Further, a new aim is beginning to make itself felt, and its realization in many instances is a remarkable testimony to the progress of a subject which so recently was pushed into the background almost universally. The study of education is no longer confined to the professional needs of the teacher, but is thrown open for its cultural value and importance in civic life of the future citizen in all walks and professions of life. While in the early stages of its development education was given no academic credit, it is now everywhere recognized as a proper study in the junior and senior years. The historical sketch given above illustrates how education has gradually become independent of other departments. This not only adds new dignity to the subject, but permits it to develop along lines appropriate to it. With this goes the question of organization. As was indicated in the historical sketch, the study of education began as an appanage of one of the older chairs, and it has gradually developed to such dimensions that a separate organization was found necessary for it. In many instances, especially in the smaller colleges, the courses in education continue to be given in the department of liberal arts and sciences; at Michigan University education forms part of the department of literature, science, and arts. While it is true that some parts in the study of education touch the academic departments very closely, the general feeling is that this subject should be organized in separate departments in colleges and in separate schools or colleges in the universities, while liberal arrangements can easily be made for intimate relations between related branches.

Considerable advance has been made on the period when the study of education, under the title of didactics or pedagogy, could be dispensed in one or two books, like David P. Page's *Theory and Practice of Teaching* (New York, 1847), or Alonzo Potter and George B. Emerson's *The School and the Schoolmaster* (New York, 1842), which covered the principles of education, method, hygiene, administration, and school management within the limits of four or five hundred pages. These two books for a long time held the field, the first being republished in 1885 by W. H. Payne. As in most fields of study, no universal plan or system prevails in America in the study of education. All manner of courses are found, between institutions like Teachers College, Columbia University, and the School of Education, Chicago University, on the one hand, and the small college on the other. History of education, psychology, principles, and methods of education are offered in nearly all institutions. It has remained for the larger institutions with greater wealth and better equipment to differentiate, so that they are able to offer preparation for elementary and secondary teachers, supervisors, superintendents, college teachers, and special subject teachers, as well as to supply the needs of the student who wishes to undertake important research work in education, and to the extent of establishing traveling scholarships for the study of comparative systems of education. The following instances are cited merely by way of example to illustrate both institutions which are recognized as the most important and those which may be said to offer average facilities. In each case only those courses which deal purely with some aspect of educational study are mentioned, the correlated courses in other departments being omitted.

Teachers College, Columbia University. — History and principles of Education: history of education in modern times; the educational theories of Herbart and Froebel; social and philosophical foundations of Greek and Roman education; history of education (graduate course); history of education in the United States; history of education in England; the historical foundations of modern education.

Philosophy of Education: logic as applied to teaching; social life and school curriculum; fundamental principles of education; educational sociology; philosophy of education (graduate); the public school and democracy; historic relations of philosophy and education; philosophy and sociology of education.

School Administration: comparative education; organization and administration of school systems; comparative education (advanced course); administration of public education in the United States; current problems in elementary education.

General and Educational Psychology: the applications of experimental and physiological psychology to education; readings in educational psychology; the psychology of childhood; psychology and education of exceptional children; educational psychology; the psychology of elementary school subjects; the application of psychological and statistical methods to education.

Secondary Education (general and advanced courses): secondary education in Germany; problems in secondary education.

Theory and Practice of Teaching in Elementary Schools: criticism and supervision of instruction in the primary school; supervision of instruction in the elementary school; the relationship of the kindergarten to the primary school; criticism and supervision of instruction in the elementary school; special problems in the theory and practice of elementary education.

Kindergarten Principles: theory and practice of kindergarten teaching; curricula of kindergarten normal schools and problems in kindergarten supervision; gifts and occupations; songs and games; stories; design in kindergarten; play and games.

Religious Education: introduction to religious education; the Sunday school; the principles of moral education; the analysis of religious phenomena.

In addition the theory and practice of teaching special subjects such as biology; domestic science; English; fine arts; French; German; geography; history; Latin; manual training; mathematics; music; nature study; physical education; physical science.

Chicago University. — History of Education: history of education (elementary); history of European education (ancient and medieval periods); history of European education (modern period); history of education (modern period); history of American education.

Administrative and Social Aspects of Education: school administration (introductory course); school supervision; state and municipal school systems; state school administration; the schools of Germany, England, and the United States; methods of organization and instruction; administration of secondary education; problems in secondary education; the course of study in the elementary schools; curriculum; the school and the community; special schools and supplementary social agencies; philosophy of education; moral education; general principles of fine and industrial art; industrial education in public schools.

Educational Psychology and Mental Development: educational psychology (introductory course); educational psychology (advanced); individual psychology; elementary genetic psychology; child study; introduction to experimental education; experimental education; the psychology of reading; the psychology of writing; educational tests; genetic psychology; experimental problems in education.

Educational Methods: general principles of methods; principles of method for elementary teachers; principles of method for high school teachers; survey of special methods in elementary education; criticism and supervision of teaching; development of modern methods of teaching in elementary schools; practice teaching.

General Principles and Special Problems of Education: principles of education; public education in America; principles of education; advanced principles of education: current problems in education; German pedagogy; mental deficiency and retardation in school.

Religious Education: history of the Sunday school; introduction to religious education; the materials of religious education; methods of teaching the Bible.

Kindergarten Education: kindergarten theory and practice (elementary); principles and methods in the kindergarten; theory and practice (advanced); the kindergarten program; critical study of the kindergarten program; kindergarten observation; Froebel's educational theories; plays and games.

In addition the theory and practice of teaching special subjects such as history; home economics; Latin; German; mathematics; English; physics; geography; natural science; elocution; children's readings and school libraries; hygiene and physical education; music; æsthetic and industrial education.

Harvard University. — History of educational practice and theories; the history of education in Europe since the Reformation; introduction to the study of education; school administration as a branch of municipal affairs; modern theories of education; the education of the individual; educational theory in the early nineteenth century; organization and management of state and city schools and school systems; secondary education, public high schools, endowed and private schools; elementary education, programs of study, equipment, administration; the theory of statistical work and the application of statistical method to education; contemporary problems in education; the evolution and present status of education in certain selected states.

University of Texas. — School management; the process of teaching; principles of education; psychology of education; psychology of development; history of education; philosophy of education; abnormal psychology; psychology of adolescence; courses of study and organization of high schools; school supervision and administration; seminaries in psychology and history of education; teachers' courses in mathematics, botany, Latin, history, physics, physiography, German.

Similar courses, if not under similar names, are found at the University of Michigan, University of Wisconsin, and Cornell University, with some additions which may be mentioned: Michigan offers courses also in school hygiene; educational theories of the Greeks; comparative school systems; history of educational systems in America; social education. Wisconsin has comparative educational administration; experimental education; contemporary educational movements. Cornell provides courses in experimental investigation; school hygiene; and industrial education.

These courses are intended both for graduate and undergraduate study. In addition to the opportunities for advanced study of education in colleges and universities, the teacher in service and the student may continue their educational research in the numerous teachers' voluntary associations (*q.v.*), local, state, and national; in teachers' institutes (*q.v.*); reading circles (*q.v.*); summer schools, the majority of which cater specially for the teachers' needs and furnish many of the courses specified above. Of wide scope and influence are the National Education Association (*q.v.*), with its many departments and its annual publication; the National Society of College Teachers of Education; the National Society for the Scientific Study of Education; Section L (organized 1906) of the American Association for the Advancement of Science. The number of national journals (*q.v.*) and the annual bibliography published by the United States Bureau of Education both testify to the extent of educational research in this country. Further, the study of education is considerably advanced by the numerous commissions (*q.v.*), education boards such as the General Education Board (*q.v.*), and foundations of the nature of the Carnegie and Sage Foundations (*qq.v.*). See, especially, Teachers, Training of; also Experimental Pedagogy; Experimental Schools; History of Education; Philosophy of Education; Psychology, Educational; and the articles on the various national systems.

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EDUCATION AND CRIME. — The theory that knowledge and right action belong together is old in the world, and more than one epoch of human history has variously emphasized its deep faith in the possibility of the realization of this ideal. The story contained in the etymology of such terms as *barbarian, heathen, boor, villain,* etc., indicates how racial and caste feelings have first assumed that ignorance and then something worse, such, *e.g.,* as vice and crime, attached naturally to certain social and environmental conditions which were without the pale of national or urban "culture." The attribution, on the part of the city dweller, of ignorance to the peasant and the mere country man helped the "educated " for ages to shut their eyes to the increasing " wickedness " of the great aggregations of human beings becoming more and more numerous as the civilization of modern times demanded this expression of its expansive life. But, on the other hand, the longer memory of the country folk recalled the time when cities were altogether unknown, and blamed the iniquities which were perceived in a culture constantly becoming more complex on the very conditions of urban life itself, and declared, with the poet, that God made the country, but man (or the devil) the town. These two ancient views are reflected still in the explanations offered for the prevalence of crime in human society to-day. But it is idle to say that the question is settled by stating that the sole or even the chief factor in the essential criminality of children in particular to-day is the existence of the city, which has lost the old " purity " of the country; the " innocence " of the country, past and present, is fictitious and not real. To education, as a survival factor of mankind, the country offers quite as serious problems for solution as does the city.

Much philosophic thought about the matter has begun and ended with the famous words of Gray: —

> "Where ignorance is bliss,
> 'Tis folly to be wise,"

or the equally well-known lines of Pope: —

> "A little learning is a dangerous thing;
> Drink deep, or taste not the Pierian spring."

Not a little of the discussion of the relations of education and crime to-day might be classified within these limits, — letting happy ignorance alone, and " drinking largely "; there being a considerable body of opinion to the effect that a smattering of knowledge is worse than none at all. After the democratic revolutions which marked the close of the eighteenth century, the development of popular systems of education (or some approach thereto) went on apace, and pedagogical philosophers saw in the expected triumph over the ignorance that had so long and so mightily prevailed among the masses the rapid disappearance of crime and its attendant evils, from which human society everywhere suffered so much. And in many authoritative quarters this optimism has continued unchanged down to the present moment. But the civilizing influence foreseen by Guizot, when he created the celebrated epigram " every schoolhouse opened closes a jail," has fallen far short of what was prophesied. The spread of education during the last century has not really been accompanied by a correspondingly marked and significant decrease in the amount of crime committed among civilized peoples; the great increase of knowledge among men has not occasioned a parallel decrease of the sort of human wickednesses usually summed up as " crime."

It may be that the rôle of education as a preventer and a suppresser of crime and of criminal tendencies has been very much exaggerated, and it is not by any means as powerful a factor for the amelioration and improvement of the race as has been believed; or, perhaps, the educational systems in vogue are chiefly at fault, and we have not yet discovered the methods by which the evolutional forces may be made most of for the formal advancement of the individual and of society. Certain it is, that the perceptible, direct influence of education in this matter and its service in the abolition of crime and criminality have fallen far below the hopes and estimates of the enthusiastic champions of popular education in the first half of the last century. It may also be said that some forms of crime have been increased by the growth of popular education, or have waxed stronger in spite of it, while some new ones even have been added to the category, not as mere proscribed offenses due to new laws of very doubtful wisdom or necessity, but as the immediate result of the increase in the spread of knowledge itself. And, if there is taken into account the progress in morality, especially, that seems to occur secularly, irrespective, apparently, of the particular forms of human institutions, etc., it may be argued also that the indirect effects of education have likewise been far less than had been confidently and generally expected. Drs. Bianco and Gandolfi, in their discussion of the efficiency of the school in the struggle against crime, emphasize the failure of popular education throughout the civilized world to justify the optimistic predictions once made in its behalf. Statistics from various parts of the world (particularly certain regions of France and Portugal) indicate that the wealthier and better educated classes are proportionately more criminal than the poor and the ignorant or illiterate. This, to be sure, is not true everywhere, but there is enough of it to make one doubt the adequacy of modern educational methods in coping with the situation. Increasing criminality is doubtless due in part to the growing individualism of the times, the spread of urban environments, and the exploitation of child life in innumerable new ways, etc. The school, evidently, does not furnish to the child, withdrawn for so long a time as modern educational methods have now made necessary from the home, an effective defense against that home which reflects the economic and material spirit of the times, and besets the returning scholar with suggestions and temptations, which the mere intellectual equipment given by the state is often utterly powerless to combat or to counteract. It is many times true also that the home, bad as it is, is more human than the school, and, therefore, more influential socially;

it has in it, naturally, more of the life of the child, and when it comes to a break with one or with the other, instinctively the child is home-led and home-suggested, or adult-led and adult-suggested in that environment, and not in the scholastic one. It is quite evident that the school, if it is to replace the home, must be an evolutional and not an artificial substitute. Children often turn into criminals because the environment which makes them so is so much more human than that which seeks to make them scholars. Evidently, in our own day, crime modifies itself sufficiently, in many cases, to obtain the sympathy of the home, and thus survives in spite of the efforts of the school, which has not yet learned how best to make knowledge serve righteousness. Ferriani, the distinguished Italian criminologist, who made a special study of juvenile offenders, does not hesitate to say that " an ignorant honest man is worth a thousand educated rascals," and that, while the elementary schools may be increasingly useful in the amelioration and the prevention of crime and criminal tendencies, excessive education may play an important rôle in developing the germs of crime in children more or less degenerately affected. It is, indeed, he says, the educated classes who, in many respects, are the very worst offenders; it is hard to estimate the total effect upon society of " their conventionalities, white lies, opportunism, loose ideas of morals and justice, defiance of law and neglect of necessary duties, etc." Needless education, likewise, makes doubly dangerous the love of money, a weak conscience, hypocrisy, and other human failings. The bad example of state, school, and family, " the protective trinity of childhood," seems often more contagious and more infectious than the good done or capable of being done.

Ciraoli, moved by his investigations into the life and experiences of the evil women of the city of Naples, made this interesting statement: " The most notable institution for moral discipline is the home, the second the school, the last the city, the teacher of practical life. If a woman finds herself in the last, without having made a sufficiently lasting stay in the first, her moral education lacks its foundation, and the preparation in school is not enough to afford resistance against the charm with which city life has surrounded what the theologians call sin." This applies largely to men also; and to a considerable portion of the country as well as to the modern urban community. It is possible that the school city, the " Junior Republic," and other experiments along a similar line now being worked out in America, may contribute much to the solution of the crime problem, but they must keep in closer touch with the home than they seem to be doing in many cases, if they are to be real factors in the struggle against crime and vice of all sorts.

De Lanessan also points out the crimes and offenses condoned by special classes in the community: the loitering of workmen on their jobs, the watering of wine by otherwise honest peasants, the cheating by grocers and other merchants large and small, breaches of trust, sharp practices in the various professions, etc., the " crimes " of labor, which are all of considerable influence upon the family of the adult who is guilty of them, and upon the young of both sexes, who early learn the existence of such things, and soon become dishonest enough to condone or to copy them.

The ethical dualism that prevails in so many quarters of modern civilization is responsible, many think, for not a little of the failure of education to unify the morals of children and youth. Here the effect of bad example is most marked and most notorious. Proal, in his *Political Crime,* has discussed this question in detail, especially as related to politics and social procedure. The prevalence of smuggling, tax-dodging, cheating the government in innumerable ways, ballot-box stuffing, forgery, embezzlement, etc., among educated people ; the defiance of law and order and the invasion of individual and personal rights by students in schools and colleges ; frauds in examinations, athletic contests, etc.; the " criminal " *esprit de corps* of secret societies and like organizations ; the use of the lottery in the name of charity and the church; the creedal opportunism of ministers of the Gospel; the " honorable " lying of the gentleman; the deceiving of women by men before and after marriage; the deliberate concealment of necessary facts from children, and the substitution for these of useless and even dangerous fictions, — all this practically assists in the survival, perhaps also in the creation, of crime in a way few people commonly think of. It is a perilous crisis for the child, when he discovers that those whom he has trusted have been deceiving him, even father and mother. And no school exercises at present existing are capable of restoring what has thus been lamentably undone. If adults would remain honest and honorable, there would be few, if any, criminal children.

Dr. Albert Wilson, one of the most recent of British authorities to treat the question, says in his book, *Education, Personality, and Crime* (p. 147): " As a critic of state methods, I should say that the three R's have filled many a prison. Most of the criminals examined have passed average standards; some have done well. In none have I found school influence producing any valuable effect. Had they been in good private schools, some would probably have been saved, and the others would have been better without the three R's. Instructed degeneracy is a formidable weapon against peaceful communities. In olden days, the illiterate used their intelligence or associative powers with more useful results, and were far happier; whereas now the same class fill their minds with penny dreadfuls and improper subjects, and suffer from a mental autointoxication. What will become of us if the religious and moral training is expunged from the already imperfect, undeveloped system? Crime is not lessened by teaching that it is wrong to steal. It is the effect of reasoning and demonstration which prevents crime. We must associate on the mental screen pictures of the horrible nature of such actions and the dangerous consequences. When the temptation arises in the sensory centers, and desire is followed by choice, the well-stamped moral and religious 'associations' may dictate a choice which is at the same time prudent, wise, and righteous."

Dr. Wilson in *Education, Personality, and Crime* believes that decrease of crime is due not so much to board schools as it is to social improvements, — children are not "born tired," but are *made* so by the State, which, moreover, destroys individuality and dwarfs personality. He goes so far as to say (p. 143) that the State has sinned "in destroying private schools, which represent the ideal system." He is also of the opinion (after years of observation) that "children should have a sound religious training," but one neither dogmatically sectarian nor controlled by "men's traditions." Instruction by the State, however, cannot be a substitute for education by the parents from the cradle; and free street play is often far better than compulsory school attendance; food for the body must always precede food for the mind. It must be remembered, too, that "crime is always changing with the times, as are also the indictable offences, and the quantitative and qualitative methods of administration." What education has really done Dr. Wilson sums up thus: "Crime has its fashion, and must be up to date, or it would die out. Crime aims at being a science as well as a refined art; the older clumsy and often brutal methods are passing away, and this alteration, one freely admits, is due to modern education" (p. 13).

The view that much of crime is "due to bad education, to bad example, to city life, etc.," is set forth by Dr. Lebas, who emphasizes the rôle of education, preventive and reformatory legislation, and the efforts of society to correct and abolish evils and suggestions of evil for which it is itself responsible. Another very recent monograph along similar lines is Dr. J. L. de Lanessan's *The Struggle against Crime*, the core of whose argument is the following: "The opinion that all abnormals or degenerates must be more predisposed toward vice and crime than normal individuals cannot be accepted. For everybody to be honest, all that is needed is to give them a physical and a moral education as well as possible adapted to the organic and physiological conditions in which each one finds himself." It is a mistake to think that, with progress from savagery to modern civilization, vice has disappeared from human social communities, — what has really happened is simply that the number of vicious individuals has decreased. Another mistaken idea, according to de Lanessan, is that crime is hereditary, whereas it is merely a question of "bad family education." When the toll of bad education and bad example has been taken, there is little left to dispute about; with good education and good example, crime would practically disappear altogether. De Lanessan is in favor of a maximum of State interference for the protection and education of children. While there is no necessary criminal tendency in very nervous and excitable children, an exceptionally good education ought to be provided for them; and all children whose parents or adult maintainers are away from home too long to make them proper guardians should be attended to by the State. As a means of self-defense, society has the right (and ought not to be hindered in the exercise of it by any considerations of free will, moral responsibility, punishment, etc.), to remove from contact with criminal or vicious parents (and other adults), and from environments suggestive of crime and vice, all children in danger of developing into useless or evil members of society. As to juvenile criminals, he believes that all such appearing before the courts should be sent to special schools (industrial, military, etc.), where they should remain until they become of age for military service, from which they might be supposed to benefit. De Lanessan is more optimistic than many concerning the effects of "good education" in the abolition of vice and crime, and exaggerates the results of "bad education" as an actual factor in the production of criminals. Like some other writers of similar tendencies, he does not recognize the factor of personality, which, in criminal as well as in normal actions, is of great importance.

Overemphasis upon education as a preventive of, or a cure for, crime and criminal tendencies has sometimes come from hard-and-fast acceptance of the theory that anatomical type, language, and culture were originally closely correlated, and have in essentials remained so since. In America to-day education as a possible "crime cure" suffers not a little from the "biological basis" of much of our machinery of instruction, and the attempt to see in the development of intelligence in the race and the individual "stages," "periods," "phases," "epochs," etc., corresponding to other alleged successive epochs or stages in psychical and bodily growth in man and the other animals. The attempts to base reformative education on the "recapitulatory theory," the "three stages of culture (hunting, pastoral, agriculture)," are in some respects worse than the efforts to utilize them in the normal courses of instruction. The "three-stage" theory of the evolution of human culture is now discredited by the best anthropologists and ethnologists, as Professor W. Lay and Professor H. I. Smith have recently pointed out, and its employment as an education panacea must soon end. Little hope exists of preventing the appearance of crime among children (inferentially also among adults) by the use of methods dependent upon wholly false or partly false interpretations of the course of human evolution in the race. If there is any parallelism between the history of the individual and the race, those methods only can be of essential value in educating the individual which really correspond to phenomena in the racial past, and not to such as are presumed or imagined. The ideas that children represent the past of the race, and that they tend to represent the worst of it have been overworked in connection with very modern educational theories. "Back to nature," country life, manual training, physical culture, industrial education, etc., while all, doubtless, of value in certain ways, are, nevertheless, not panaceas for the eradication of crime any more than they are infallible guides for the normal development of the sane and healthy individual. Their failure to solve the problem of normal education prepares us for reasonable skepticism as to their effects upon the abnormal and the so-called degenerate. In the grasp of the pedagogue and the reformer they lose too much real generic humanity to be thoroughly effective with the most generic of all human beings, the child. And it sometimes seems as if the ultimate solution of the problem was put off still further in the future by the exploitation of so many special "fads."

Lombroso, the father of modern criminal anthropology, once said, concerning education and crime: "Education can prevent a good nature from passing from infantile crime to habitual crime, but it cannot change those who are born with perverse instincts." This view of the matter gives us two prime sources of criminals, the children who by nature are temporarily or transiently criminal, and those who are "born criminal" inevitably. Even if education did nothing but save normal children from becoming habitual criminals, its rôle in human social evolution would be very important. But it is almost inconceivable that education, which ought to sum up in itself the instructive, stimulative, restorative, and recuperative, not to say transmutative, powers of human wisdom and experience, should be altogether without influence upon those deemed "degenerate" or "abnormal" even from birth. The apparent failure is rather of system than of education itself, which all along has been utilized as a method of conveying and preserving certain sorts of knowledge rather than as a generic factor of human evolution and social progress. One may justly say of the results of the educational systems of to-day that the chief trouble with them is that "Knowledge comes, but wisdom lingers." Our youth, instead of being "rich in saving common sense," are, after being educated in the approved fashion of the times, so often really poorer in it than when they began. In acquiring something specifically racial, national, something peculiar to epoch or to social order, they have lost altogether or dwarfed into "innocuous desuetude" the generically human which stands above race, age, and class. In the course of culture progress man has been too tolerant of certain specifically evil things such, *e.g.*, as war and its attendant train of evils. And crime, perhaps, belongs in this category of too tenderly handled phenomena. This is very true, if we take the view, set forth by Tarde and others, that crime, like any other branch of social activity, nourishes itself to a considerable extent upon the economic conditions and theories, the educational doctrines, the philosophic and religious beliefs and speculations of the times. Like them, also, it gets local color, *esprit de corps et de l'âme*, submits to racial transformation, class modifications, etc. In fact, in so far as such a thing is at all possible, it varies in order to survive in a community, which, theoretically, is intolerant of such elements of its cultural make-up. The rôle of the school in the struggle against crime is not that of a theater of "mental discipline," but that of an environment corresponding, on the one hand, to the home, and, on the other, to the city and the State, so organized upon sympathetic lines that the child may pass from one to the other without loss or injury. In the ideal State the child must be at home without detriment to the acquisition of knowledge, and go to school without impairment of the home sense long enough to equip him for right conduct and complete activity in the State, of which the family must always be the firm foundation. From one point of view, at least, particularly in America, the question of education and crime resolves itself into a problem of the correlation of the home and the school. Indeed, this is the one thing necessary for education in general. Everything indicates that the school is assuming too much and the family acknowledging too little responsibility. This readjustment outweighs all questions of curriculum, methods of instruction, etc. When it is accomplished, many difficulties will disappear of themselves.

A. F. C.

See CHILDREN, CRIMINALITY IN; EDUCATION; EDUCATION AND INSTRUCTION; MORAL EDUCATION; PUNISHMENT; RELIGIOUS EDUCATION; etc.

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EDUCATION AND INSTRUCTION. — The distinction between education (*Erziehung*) as a wider process and instruction (*Unterricht*) as a narrower one has been especially developed in German pedagogical theory. Education is essentially a moral and social process; it consists in the operation of all the influences, conscious and unconscious, that shape character and give direction to the affections. Instruction denotes one of the means of education, viz. the use of intellectual training in the formation of character, discipline, school life and government being the other. From the standpoint of this distinction, the discussion (raised, for example, by Herbert Spencer) as to whether education can modify character is meaningless; if it does not affect character, it is not education. Properly put, the question is how teaching and learning in their definitely intellectual aspects shall be made contributory to character forming. The problem is the more serious because, while it is almost universally admitted that the final aim of education is moral, most of the time of the schoolroom is spent concretely on matters of intellectual acquisition. If, then, instruction is not made to contribute effectively to education, the professed aim of the latter is sure to be missed. J. D.

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EDUCATION COMMITTEE OF THE PRIVY COUNCIL. — The grant of £20,000 made by the House of Commons on August 17, 1833, "in aid of private subscriptions for the erection of schoolhouses for the education of the children of the poorer classes" marked a new era of definite state intervention in the education of the people of England. This annual grant increased steadily, until to-day it exceeds £12,000,000. The grant of 1833 was administered by the Treasury under a minute dated Aug. 30, 1833. The Treasury continued to administer the annual grant until Apr. 10, 1839, when a board, being a committee of the Privy Council, was appointed "to superintend the application of any sums voted by Parliament for the purpose of promoting public education." This committee continued to administer those funds, and pursued a progressive policy until the year 1856, when the increase of the work of the committee of the Council necessitated the appointment of a Minister of Education and the creation of an Education Department. By an Order in Council of Feb. 25, 1856, (confirmed by statute the same year), the Education Department was formed and comprised the Educational Establishment of the Privy Council Office and the Department of Science and Art which had had its origin in the report of a select committee of the House of Commons, which in 1836 recommended the establishment of schools of design, a matter that was taken up by the Committee of the Privy Council for Trade. In 1856 the grant for this purpose was £64,375. In 1852 the Board of Trade had constituted a Department of Practical Art with a Science Division. The two departments, though both under the Education Minister, remained separate, and when in 1899 they were amalgamated in the Board of Education formed by statute in that year, the science and art grant was £587,793. The act that formed the Education Department in 1856 enabled the Crown to appoint a vice-president of the Committee of Council on Education who could sit in the House of Commons and thus keep the people in direct touch with national elementary education. Thus, until the Board of Education was formed in 1899, the president of the Council represented education in the House of Lords, while a vice-president of the committee represented it in the House of Commons. The Privy Council thus controlled national elementary education until the year 1899. The history of the policy of that Council which resulted in the act of 1870 and 1876 (throwing the responsibility for education partly on the local rates and making education compulsory) and the act of 1891, which made elementary education free, needs to be treated in detail by the student who desires to grasp the evolution of English education. J. E. G. de M.

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EDUCATION, COMPULSORY. — See Attendance, Compulsory.

EDUCATION, COST OF. — See School Funds; Budget, School.

EDUCATION, DEFINITIONS OF. — See Education.

EDUCATION, HISTORY OF. — See History of Education.

EDUCATION, LIBERAL. — See Liberal Education.

EDUCATION, MUSEUMS ILLUSTRATIVE OF. — See Museums, Educational.

EDUCATION OF GIRLS. — See Girls, Education of; Women, Higher Education of.

EDUCATION, PHILOSOPHY OF. — See Philosophy of Education.

EDUCATION, SCIENCE OF. — See Philosophy of Education; Principles of Education; Science of Education; Education, Academic Study of; Teachers, Training of; Pedagogy; Psychology, Educational.

EDUCATIONAL ATHLETICS. — See Athletics, Educational.

EDUCATIONAL ASSOCIATIONS. — **General.** This term may be and is quite frequently applied to include a great number of organizations of teachers of recent times, though the term Teachers' Voluntary Organizations (*q.v.*), is more accurate. It may also include that type of organization dating back to the close of the Middle Ages, which aimed to organize a teaching force to improve the general intellectual, social, and moral conditions of the people. Most of these latter have been religious in their motive and ecclesiastic in their origin. Hence the term Teaching Congregations (*q.v.*) would accurately describe those which arose preceding and immediately after the Reformation. These are discussed under the appropriate titles. The remainder of those societies mentioned in the section following are also religious in character, but the membership is not composed of teachers. They are not teaching orders, but associations for the promotion of education. To these the term "educational society" may be appropriately applied. The most important of these are also discussed briefly under the appropriate separate titles. But the term "educational association" is also used to describe the type of organization which grew up in most countries in western Europe and in the United States in the early part of the nineteenth century for the encouragement of popular interest in education and for the improvement of school conditions. Such associations grew out of the same general condition which produced the public educational systems of this period. The fact that the German states were better provided with public school systems than the other countries mentioned is an explanation of the slighter importance of such organizations there. Such as existed were minor or local associations, looking toward specific educational reforms such as those of Basedow and the advocates of physical education.

After the middle of the nineteenth century these associations generally developed into associations for teachers; either of a general scope or of teachers of the highly specialized phases of education. Such associations will be treated under the caption Teachers' Voluntary Associations. More recently, associations for general educational propaganda are again becoming prominent. These are usually devoted to the promotion of special educational causes, such as moral or industrial education. (See Religious Education Association; etc.)

It is difficult to say with certainty what was the earliest of the various European voluntary societies for promoting education among the poor, but it probably was the society founded by Gerard Groote at the end of the fourteenth century and known as the Brethren of the Common Life (*q.v.*), the society to which Thomas à Kempis owed his education. At the end of the sixteenth century (1599) the Jesuits (*q.v.*) had brought their method (*Ratio Studiorum*) to perfection, and had then been at work with this end in view for fifty years. The society founded by César de Bus in 1592 near Avignon and known as *La Congrégation de la Doctrine Chrétienne* probably paved the way for later societies that limited their work to the education of the poor. The Oratorians (*q.v.*) and the Port Royalists (*q.v.*) in the seventeenth century had a larger goal than this, and certainly an outlook that had in it more of the Renaissance ideal than was presented by the Jesuit method. The Institute of the Brothers of the Christian Schools was founded by St. Jean Baptiste de la Salle on May 27, 1684. About the same date as the French and English societies must be placed Francke's (*q.v.*) work for poor scholars at Halle.

England. — The history of educational associations in England is peculiarly the history of the development of elementary education. Purely professional societies are of more recent growth than societies for the promotion of the education of the masses. But the last few decades have witnessed the rapid rise of societies, professional and lay, for the advancement of every phase of education. Probably the earliest association of importance in the history of English education was the Society for the Promotion of Christian Knowledge (*q.v.*), founded in 1698 by Dr. Bray. In 1785 the Sunday School Society was established, and soon met with great success both in the number of pupils reached and the number of teachers employed. The two societies which laid the foundations of the present system of elementary education were the British and Foreign School Society (*q.v.*), founded by Lancaster's friends in 1808, and the National Society for Promoting the Education of the Poor in the Principles of the Established Church (*q.v.*), established by Dr. Bell in 1811. A third society of a similar type was the Christian Instruction Society founded in 1825 to represent the views of Baptists and Independent Dissenters. Irish education was promoted, among other associations, by the Kildare Place Society (*q.v.*), for undenominational education, founded in 1811, and the London Hibernian Society, established on Protestant principles in 1816. In 1836 was founded the Home and Colonial Infant School Society (*q.v.*) which trained teachers for infant schools. The Central Society, founded in 1837 by Sir Thomas Wyse and others, collected and published educational information of a statistical, historical, and descriptive character. In 1844 the interests of ragged schools, especially in London, were promoted by the Ragged School Union. In 1848 the recently formed Congregational Board of Education arranged for a series of lectures to propound the views of the Board. The course was delivered at Crosby Hall, and was well attended. They were published in 1848 as the *Crosby Hall Lectures on Education*, which contain objections against government action in education, and the advantages of voluntary effort. The years from 1850 to the passing of the act of 1870 are full of interest in the history of educational agitation and associational activity, much of which coincided with the democratic movement in the north of England. The Lancashire Public School Association was founded in 1847, and in 1850 assumed the title of the National Public School Association, for the establishment of unsectarian rate-aided schools under a democratic system of government. In the same year (1850) the Manchester and Salford Committee came into existence to maintain the opposing side of sectarianism. In 1869 the National Education League was launched in favor of unsectarian public education, and was opposed by the formation in the same year of the National School Union, which stood for denominational principles. Many of the associations which appeared during the period of agitation went out of existence as soon as their objects were achieved.

Other societies which interested themselves in the promotion of general education also arose during the nineteenth century, among which the Society for the Diffusion of Useful Knowledge founded in 1825 by Lord Brougham must be mentioned. The National Home Reading Union (*q.v.*) was established in 1887 to stimulate and direct home reading; and in 1903 the Workers' Educational Association (*q.v.*) came into existence for the promotion of higher education of working men and women. The Recreative Evening Schools Association (1886) has for its object the creation of public interest in and the establishment of continuation schools of a practical and recreative kind.

Organizations of another type are associations for the promotion of public and professional interest in the scientific study of education. One of the earliest of these was the Education Society, founded in 1875 "for the development of the science of education," and since 1889 amalgamated as a section of the Teachers' Guild, itself a national organization established in the interests of the teaching profession. Established as early as 1846, the College of Preceptors (*q.v.*) sought to advance the interests of education by training and certificating teachers. The Parents' National Educational Union (1891) seeks to disseminate among parents the best principles of education and training children and bring the home and school into close sympathy with each other. The Child Study Society has a membership of parents and educationists for the study of mental and physical condition of children and of educational methods. The aims of the Moral Education League, founded in 1897, are obvious from the title of the society. Since 1901 the British Association has devoted a section (Section L) to the discussion of educational topics, which has gained in strength and importance every year. The contribution of the North of England Council for Promoting the Higher Education of Women (1867–1874) to the cause which it espoused must also receive mention. The Froebel Society (1874) and the National Froebel Union were founded in the interests of the education of young children, the latter organization granting certificates to teachers through its examining board.

Teachers' professional associations have developed largely within the last fifty years, or even less. These will be discussed under the title TEACHERS' VOLUNTARY ASSOCIATIONS.

France. — Associations of teachers for the study of educational questions may be divided into three classes, none of which is devoted solely to the study of these questions.

1. Associations of professors or instructors organized for the defense of their professional interests, for mutual assistance, etc. They also study questions of instruction and school discipline, pass resolutions on the curriculum, estimate the comparative value of different books used in the school, etc. An example of

this type is the Educational Society of Principals of Public Primary Schools in Paris (*Société Pédagogique des Directeurs et Directrices des Écoles Primaires Publiques de Paris*). The discussions at their meetings are published in their bulletin. They exercise a sufficiently great influence on education, since the principals, to a certain extent, are free in their own schools to employ such methods as seem preferable to them.

2. Associations or leagues for the improvement of hygienic conditions or scientific methods of instruction. These societies include at the same time teachers, parents, medical men, philanthropists, etc. They discuss the social value of methods of instruction, the best arrangement of the curriculum, the utility of certain measures for the improvement of school hygiene, the health of the pupils, etc. They have no direct influence on the school, although they have teachers among their members. But they lay their views before the public authorities which examine them for any hints they may offer. Typical of these associations is the League of Doctors and Families (*La Ligue des Médecins et des Familles*), established in 1902 for the improvement of physical and intellectual hygiene in the schools. It organizes national and international congresses for this purpose.

3. Scientific associations for the study of child psychology, the educational value of methods of instruction, etc. This membership includes at the same time teachers, scientists, and others who take a theoretical interest in educational questions. The teachers meet there to exchange the practical observations made in the classroom in return for the scientific views on the child given by psychology and physiology. The best known of these societies is the Society for the Psychological Study of the Child (*Société pour l'Étude Psychologique de l'Enfant*), suggested in 1902 by F. Buisson in the *Correspondence de l'Enseignement Primaire*, and organized in 1899 by F. Buisson, L. Marillier, etc. This society has branches in Lyons and elsewhere.

Other analogous associations devote themselves to the methods of teaching abnormal children, *e.g.* the *Société du Patronage Familial*, in which Dr. J. Philippe and Dr. Paul Boncour organized a medical-pedagogical clinic in 1902; the *Société de l'Œuvre de l'Enfance Anormale* established in Lyons in 1906 by M. Granvilliers, Professor Beauvisage, and others; and a society in Bordeaux founded in 1906 by Rector Thomin, Professor Regis, and others.

J. P.

Germany. — While there is no country where the teachers are more thoroughly organized, the broader type of educational associations, which is not specifically composed of teachers, has not been so important. This is due to the fact that several centuries earlier governmental activity had accomplished in the way of establishment of public schools that which in America and England was left to popular propaganda during the early nineteenth century. The more important of these teachers' associations are discussed under TEACHERS' VOLUNTARY ASSOCIATIONS.

Outside of these general teachers' associations, there are many societies which are devoted to particular movements in pedagogy, such as the Herbart societies, to the study of methods in the different school studies, particularly drawing, gymnastics, manual training, etc.; or are engaged in the pursuit of economic or charitable objects for the benefit of teachers and their families. The last-named societies are often known as *Pestalozzivereine.*

There are many other associations for the promotion of particular objects, such as female education, industrial education, improvement of instruction in drawing, natural science, mathematics, modern languages, etc. Lastly there may be mentioned two large and widely extended associations with educational purposes, though not mainly composed of teachers, namely the *Allgemeine deutsche Sprachverein*, the object of which is the purification of the German language from unnecessary foreign words, and the *Allgemeine deutsche Schulverein*, which helps to establish and to keep up German schools in the Slavic and Hungarian parts of Austria, in South America, and in other parts of the world, where a German-speaking minority, living among a non-German population, needs to be assisted in its struggle to maintain its native language and civilization. A recent educational reform movement of great importance has given occasion to the formation of three societies which include numbers of people outside of the teachers' profession, associated with others from within the profession to secure the adoption of specific educational policies.. The three associations most prominent in the agitation that brought about the changes in the secondary school system of Germany, and culminated in the conference of December; 1890, and June, 1900, are the *Verein für Schulreform*, established 1889, favoring radical changes, the *Gymnasialverein*, which is conservative, and the *Einheitsschulverein*, advocating a unification of school types, an organization of the moderate liberals.

The services to the cause of popular education in Germany rendered by these various associations, especially those of the teachers themselves, can hardly be overestimated. Through their collective efforts the intellectual, financial, and social condition of the teaching profession has been raised, the work of the schools has been steadily improved, and the respect for popular education on the part of the public, as well as on the part of the political rulers, has been greatly increased.

United States. — The American Institute of Instruction (*q.v.*), which was organized in 1830 and is still in existence, was the first educational association formed in the United States. Until the more recent developments of the National Education Association, it met the needs of a national organization; for while its membership has always been largely from the New England states, representative educational leaders in most of the states of the Union have always participated in its councils. The Western Literary Institute (*q.v.*), although contemplated as early as 1829, was not formally organized until 1831. It met an educational need in the Mississippi valley not unlike that supplied by the American Institute of Instruction in New England. Fifteen annual sessions (1831–1845) and three extra meetings were held. The American Lyceum Association (*q.v.*) was organized in 1831 and held its last annual convention in 1839. It aimed primarily to advance the interests of popular education through the establishment of public libraries, lecture courses, and museums. The American Association for the Advancement of Education (*q.v.*), which, in some important particulars, was the parent of the National Education Association, was organized at Philadelphia in 1849 and held yearly meetings until 1856. It was distinctly representative of the new state school systems which came into prominence at this time. The National Teachers' Association (*q.v.*), which was the immediate predecessor of the National Education Association, was organized at Philadelphia in 1857. The subsequent career of these associations will be given under TEACHERS' VOLUNTARY ASSOCIATIONS.

A still more recent development has been the formation of organizations of students interested in the technical study of education. Thus in 1895 was organized the National Herbart Society for the Scientific Study of Teaching. To this society is due much credit for the encouragement of scientific investigation and a more thoughtful consideration of educational problems. In 1902 this society broadened the scope of its interest and was reorganized under the title, National Society for the Scientific Study of Education. In 1902 was organized in connection with the midwinter meeting the Department of Superintendence of the National Education Association, the National Society of College Teachers of Education. This society devotes its attention to the consideration of problems of organization and methods of collegiate and university departments of education. Section L, organized 1906, of the American Association for the Advancement of Science, is devoted to the discussion of education.

Special interests continue to bring into existence societies which are national in their scope, influential in their work. Among those of recent origin are the National Society for the Promotion of Industrial Education (1906); and the Society for the Study of Moral Problems of Education. Occasional congresses such as the Congress of Social Education, Boston, and the Moral Education Conference (New York and Providence, 1911), serve a purpose similar to that of these associations, and differ only in the fact that the permanent organization is more in the nature of a committee which provides for meetings and a general attendance of what may be considered merely temporary members.

See TEACHERS' VOLUNTARY ASSOCIATIONS.

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See references under TEACHERS' VOLUNTARY ASSOCIATIONS.

EDUCATIONAL CONDITIONS, DIVERSITY OF. — One of the most marked features of public education in the United States is the great diversity in the racial, economic, and administrative conditions which determine, in large part, what kind of an educational system can be maintained. So greatly do these conditions modify education that in no two states, and often in but few counties within a state, do approximately the same educational conditions exist. Even within the same county two different towns or cities frequently present quite different educational conditions. Still, notwithstanding these diverse conditions, certain similarities exist within certain geographical areas, and one frequently speaks of the educational systems of certain groups of states as presenting somewhat similar educational conditions.

Education in the New England states, for example, is perhaps most guided and in some respects encumbered by historical traditions, which not infrequently stand in the way of needed educational reform. Here one finds some of the best as well as some of the poorest of schools. Local taxation is highly developed here, but general taxation for a state school system, as opposed to a series of local school systems, is as yet in its infancy. Secondary education is well developed, but the state university is almost everywhere lacking. In both the North Atlantic group of states, which includes the New England states, and in the North Central states, we find a very mixed population, due to the fact that the greater part of our great foreign immigration has settled in the states of these two groups. The negro problem, however, is not marked here. The states of these two groups, too, are most advanced in manufacturing, trade, and industry, and the combination of these two factors has resulted in a dense and highly mixed population and in the development of large commercial and manufacturing cities, and has brought to the front some of the most complex and most difficult educational problems now confronting American school officers. In the North Central division in particular we find a very deep interest in education and a willingness to pay for schools. Secondary education and the state university are well developed here, and the numerous educational associations and the large attendance at summer schools indicate a deep interest in educational problems on the part of the teaching staff. In the South Atlantic and South Central groups of states entirely different educational conditions exist. These states are not so densely settled, and are essentially rural and agricultural, and they have not as yet recovered financially from the ravages of the Civil War. High taxation here produces but a small income. The elementary schools are frequently very poor, and secondary education is only now in the process of development. In addition, all of these states have a large negro population, which in many counties exceeds the white population in ratios of two, three, and four to one, and for the negroes a separate school system must be maintained.

In the Western Division, which comprises the group of states extending from the Rocky Mountains to the Pacific Ocean, we find a sparse and scattered population, possessing large initiative, relatively large wealth, a strong belief in public education supported in large part by general taxation, much advanced legislation, and good schools. Some of the best rural schools in the United States are to be found in this Western group of states; there are many well developed secondary schools, considering the sparsity of the population; and the state university is everywhere a marked feature of the educational system of the state.

Many elements contribute to the formation of the educational attitude of a people, and many things condition the possibilities of properly supporting a school system. The presence or absence of good or bad historical traditions; the presence or absence of intelligent and effective leadership, resulting in good administrative conditions and good school laws; the presence or absence of natural resources, good climate, accumulated wealth, agricultural possibilities of a high order, and an intelligent and thrifty population; and the demands made upon the school system by the presence of diverse races or complex social conditions; — these are some of the important elements which modify educational conditions and limit educational possibilities, and these vary greatly in the different states and groups of states.

E. P. C.

For a more detailed statement of educational conditions in the different states, see the articles on the state school systems, as ALABAMA, ARIZONA, etc., under the subdivision *Educational Conditions.*

Reference: —

CUBBERLEY, E. P. *Changing Conceptions of Education.* (Boston, 1909.)

EDUCATIONAL JOURNALS AND JOURNALISM. — The earlier type of publications indicated by this title was quite different from the educational journal of the present, designed for the members of the teaching profession. During the eighteenth century, magazines such as *The Tatler* (1709) and *The Spectator* (1711) in England, and the *Moralische Wochenschriften* (1713) in Germany were designed to improve the general intellectual and moral condition of the people. Along with and following these, especially in Germany, appeared the various *Annals* and magazines designed to convey popular information and practical suggestions to the masses. During the latter part of the century publications of a similar character for children appeared in considerable number. Following these came a type of publications more distinctly educational in the narrower sense, since they aimed to furnish subject matter of instruction, of a more or less popular informational type, especially along the line of the natural sciences and the newer subjects, which as yet had not been well formulated as school subjects. Out of these in the early part of the nineteenth century developed the publications designed for the members of the teaching profession, now with the establishment of the public school systems grown in number and in importance sufficient to support publications of this character. However, even earlier magazines of the type, such as the *American Journal of Education* (1826–1830) and *The Annals of Education* (1830–1837) addressed a much larger public than the teaching profession, and aimed to arouse a public interest in education and to give information appealing to a much larger clientèle. The entire subject will be treated more fully under the caption, JOURNALS AND JOURNALISM, EDUCATIONAL (*q.v.*).

EDUCATIONAL PSYCHOLOGY. — See PSYCHOLOGY, EDUCATIONAL.

EDUCATIONAL REVIEW. — See JOURNALISM, EDUCATIONAL.

EDUCATIONAL SOCIETIES. — See EDUCATIONAL ASSOCIATIONS; TEACHERS' VOLUNTARY ASSOCIATIONS.

EDUCATIONAL SOCIOLOGY. — See SOCIOLOGY, EDUCATIONAL.

EDUCATIONAL TRACTS. — See TRACTS, EDUCATIONAL.

EDUCATIONAL VALUES. — See COURSE OF STUDY, THEORY OF; VALUES, EDUCATIONAL.

EDWARD III AND ENGLISH EDUCATION. — See ANGLO-NORMAN DIALECT; ANGLO-NORMAN SCHOOLBOOKS; BLACK DEATH AND ENGLISH EDUCATION, THE.

EDWARD VI, KING OF ENGLAND (1537–1553). — Born Oct. 12, 1537, he was only nine years old when he came to the throne, and only fifteen when he died. Yet he has been held up for worship as the patron saint of Protestant learning, and reputed as the founder of the whole system of English secondary education, the inventor and donor of the Free Grammar Schools, the public schools of England. Edward was undoubtedly a well-educated boy, overeducated, indeed, under Dr. Cox, ex-headmaster of Eton, described by Ascham (*q.v.*), in the *Schoolmaster*, as "the best teacher and greatest beater of our time," and his exercises and essays show a remarkable precosity. But it is obvious that a boy of nine, however precocious, could have had no influence on public affairs, or on the act for the dissolution of colleges and chantries passed in the first year of his reign, which gave occasion for the false reputation he has enjoyed. This act abolished all the colleges, chantries, guilds and hospitals, except the cathedrals, the colleges in the universities, and Eton and Winchester as part of the universities, and confiscated their property to the Crown. This meant the confiscation of the endowment of nine tenths of the schools in England, as they nearly all formed part of or were attached to such colleges and chantries. The act indeed provided for the appointment of a commission to continue the grammar schools and assign lands out of the confiscated property for their endowment. But as there was not time, nor, in the financial straits of the public purse at the time, inclination to assign endowments, the grammar schools were continued only till further order, with salaries to the masters of the net amount which they were actually receiving from the endowment at the time of the dissolution. The song schools, which did the work of elementary schools as reading as well as music schools, were swept away. In three or four cases of quite recent foundations, such as Berkhampstead, Herts, the confiscated endowments were at once restored by act of Parliament in the same year, 1548. In perhaps a dozen cases they were restored or other lands given instead to the corporations of towns, who bought back the guild lands or were incorporated to take the place of dissolved guilds, as in the case of Shakespeare's school at Stratford-on-Avon. In about twenty cases special bodies of trustees were incorporated as "Governors of the goods possessions and revenues of the Free Grammar School of Edward VI in the town of Sherborne," or wherever it might be, and were granted sometimes by purchase, sometimes by way of gift, lands belonging to dissolved chantries or guilds, not the same which had belonged to them before, for they had been sold, but lands of other chantries which for some reason had remained unsold. The credit of the refoundation of the scanty few thus refounded must be given to John Dudley, Earl of Warwick and afterwards Duke of Northumberland, who had ousted from power and executed the Duke of Somerset, Edward's uncle, the Protector, and ruled in Edward's name from 1550 to 1553. A certain number of refoundations already arranged under Edward were actually carried out under Queen Mary and received her name. The only school foundation in which Edward had any personal share, and that was a very subordinate one, the real founders being Ridley, the "martyr" Bishop of London, and Lord Mayor Dobbs, was that of Christ's Hospital, London. This was founded not as a grammar school but as a foundling hospital, as part of a great scheme of poor relief, and was endowed entirely by the subscriptions and donations of the citizens of London.

Edward VI has, therefore, no claim whatever to be regarded as the founder or promoter of education. Educationally his reign was signalized chiefly by the spoliation of some 300, and the subsequent reëndowment of some thirty schools. A. F. L.

See Free Schools; Foundations; Reformation and Education.

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Leach, A. F. Edward VI; Spoiler of Schools. *Contemporary Rev.*, Vol. LXII, 1892, pp. 368–384.

English Schools at the Reformation. (London, 1896.)

Articles on Schools in the *Victoria County History* for Bedford; Berks; Derby; Gloucestershire; Hants; Herts; Lincolnshire; Warwickshire, etc.

EDWARD WATERS COLLEGE, JACKSONVILLE, FLA. — A coeducational institution established in 1883 and maintained under the auspices of the Methodist Episcopal Church of Florida for the education of colored students. Theological, classical, scientific, normal, English, business, bible and music courses are offered. The entrance requirements are equivalent to about four points school work. Degrees of B.D., A.B., B.S., are conferred. There are seven instructors on the faculty.

EDWARDS, BELA BATES (1802–1852). — Active in religious education; was graduated at Amherst College in 1824. He was tutor at Amherst, secretary of the American Education Society (*q.v.*), editor of the *Quarterly Journal of the American Education Society*, and professor in the Andover Theological Seminary. Author of the *Eclectic Readers* (1835). W. S. M.

EDWARDS, EDWARD (1812–1886). — One of the most active promoters of the public free library movement in England. He was for a time supernumerary assistant in the department of printed books in the British Museum. About 1846 he collected library statistics at home and abroad and published them in the *Athenæum*. He thus attracted attention, and when the committee of William Ewart (*q.v.*), met to discuss the question of free libraries, Edwards was one of the principal witnesses. He was instrumental in opening the first library maintained out of town rates at Warrington in 1848. In 1850 he was appointed the first librarian of the Manchester Free Library (opened in 1852), where he remained for eight years. He promoted improvements in libraries and librarianship. His works are important contributions to the history of libraries. hey include *Memoirs of Libraries* (1859); *Libraries and their Founders* (1865); article, " Libraries " in *Encyclopaedia Britannica* (1869); *Free Town Libraries* (1869); *Lives of the Founders of the British Museum* (1870). In 1883 Edwards was placed on the Civil List. He died in 1886.

References: —

Dictionary of National Biography.
Greenwood, T. *Edward Edwards, Chief Pioneer of Municipal Libraries.* (London, 1902.)

EDWARDS, JONATHAN (first) (1703–1758). — The famous theologian of the 18th century, and probably the ablest and most influential religious leader that America has produced; was graduated at Yale College in 1720. He was tutor at Yale for two years and was president of New Jersey College (now Princeton) 1757–1758. His writings include *An Inquiry into the modern prevailing Notions respecting the Freedom of the Will* (1754). W. S. M.

Reference: —

Allen, A. V. G. *Jonathan Edwards.* (Boston, 1889.)

EDWARDS, JONATHAN (second) (1745–1801). — The second president of Union College; was graduated at Princeton in 1765. He was active in a movement looking toward the education of the Indians, and was president of Union College for two years (1799–1801). W. S. M.

EDWARDS, RICHARD (1822–1908). — Schoolman, educated at the Bridgewater (Mass.) Normal School and the Rensselaer Polytechnic Institute. He was instructor in the Bridgewater Normal School (1848–1853), principal of the high school at Salem (1853–1854), principal of the Salem Normal School (1854–1857), of the St. Louis Normal School 1857–1862), and of the Illinois Normal School (1862–1876). He was state superintendent of Illinois from 1887 to 1891. Besides numerous papers on educational subjects, he was the author of a series of school readers and for several years editor of the *Illinois Teacher.* W. S. M.

EDWARDS, THOMAS CHARLES (1837–1900). — Welsh divine who became the first principal of the University College of Wales at Aberystwyth in 1872. It was due to his efforts mainly that the institution met with success in spite of the numerous financial difficulties with which it was beset. Edwards took an active part also in promoting the success of the University of Wales. In 1891 he retired from Aberystwyth and became principal of the Calvinistic Methodist Theological College at Bala. In 1898 his services to the University of Wales were recognized by the conferment of the first degree of D.D. granted by that body.

EFFERENT. — The term signifies " carrying from." Efferent nerve fibers are those which carry stimulations from the central nervous system back to the muscles or other organs at the surface of the body. Efferent fibers are synonymous with motor fibers and are opposed in kind and function to afferent or centripetal fibers, the latter carrying the stimulation toward the central organs. C. H. J.

See Nervous System.

EFFORT. — Effort implies the putting forth of energy in reaching an end. But not all such expenditure of energy is effort, for it may be easeful or habitual. Effort implies in addition a factor of labor, toil, pain, struggle in the surmounting of obstacles, or overcoming of difficulties, which lie between the agent and his end. Since difficulties attend the reaching of most ends that are worth while, and since there is a natural tendency to become discouraged and to abandon activity when serious difficulties are met and activity becomes disagreeable, entire educational schemes have been built around the conception of effort, though generally not under that name, but under that of discipline. Such educational schemes have frequently involved one or both of the following errors: (1) In the first place, it is overlooked that all normal effort involves an end, a good, or something satisfactory, for the sake of which activity occurs. This end for the sake of which activity occurs is of interest to the agent; or it represents an interest (as we talk of a man's business interests or concerns), something of importance, of value to him on its own account. Thus effort and interest (*q.v.*) are not normally opposed to each other, but are correlative. That is, the greater the interest in the end, the greater the desire for it, the more effort is the person willing to put forth in achieving it; while what seems of little account or worth is, for that very reason, not worth enduring much pains or trouble to reach. This statement does not imply that the end of activity is pleasure, or getting agreeable sensations; but it does imply that every genuine end is agreeable or of interest in the very fact of being an end. Effort, pain, trouble, struggle, is concerned not with the end, but with the means of attaining the end. The educational fallacy consists in ignoring the primary place belonging to an end having value on its own account, and supposing either that disciplinary effort can take place without any end in view, or else that one result is just as good as another, being but an excuse in any case for seeming willingness to undergo painful toil. (2) In the second place, it is thought that since effort in behalf of ends, in spite of difficulties, is a necessary trait of character, power of effort may best be secured by multiplying difficult tasks, introducing obstacles, making work disagreeable, and then compelling pupils to keep at work, in spite of their natural reluctance. This introduction of difficulties, obstacles for their own sake, has, however, no relation to surmounting obstacles that lie in the way of achieving an end. When there are so many ends intrinsically valuable whose attainment is attended with difficulties, there is no need to invent difficulties or create tasks merely for the sake of calling out effort and securing discipline.

There are of course many ends that are important and valuable whose worth is not immediately recognized. In their case it is, of course, a genuine educational problem to bring the young to such a recognition of their value as will stimulate to effort for their realization. But the nature of this problem is entirely misconceived when it is taken to be a matter not of leading pupils to appreciate new values, but of doing disagreeable things without any appreciation of any end. Since the latter is a psychological impossibility, when it is attempted, the effect upon the pupil is (1) to lead to evasion, shirking, procrastination; or (2) to keeping the mind upon something else which is agreeable, and doing the task with a minimum of attention and thought, in a routine, perfunctory way (one of the chief methods of inducing habits of mind wandering in pupils); or (3) fastening upon some trivial, external, or irrelevant phase of the activity as a source of interest and making that the end which carries the disagreeable means. It is, unfortunately, only too true that a skillful teacher can "arouse an interest" in performing even the most mechanical and unintelligent tasks; but if the same skill were used in leading children to appreciate the value of new ends that are intrinsically significant, so as to put forth effort, painful in itself, for the sake of realizing the valued end, a training of power in effort would be secured without the evils mentioned above, and also of a sort which would be available in the concrete situations of later life, while the training had in performing meaningless and trivial tasks is not available, to any extent, for transfer. J. D.

See EDUCATION; FORMAL DISCIPLINE; INTEREST; VALUES, EDUCATIONAL; WILL.

Reference: —

DEWEY, J. *Interest as related to Will.* (Bloomington, Ill., 1896.)

EGBERT, or EGBEHRT. — Archbishop of York (735–766) and master of the York School. In the life of Egbert, as given in the *Dictionaries of Christian Biography* and *National Biography,* he is wrongly reputed as the founder of the famous York School and the teacher there of Alcuin, its famous master. But these lives are based on an anonymous and superstitious life of Alcuin, in a "very ancient Ms. at Rheims," existing in 1617 and never seen since. This Ms. was alleged to date from 829. It pretended to be derived from information supplied by Sigulf, one of his pupils. But the date assigned to it is highly improbable, and the life is so mere a piece of hagiography, written for reading in church or refectory, being full of miracles interspersed with pious reflections, as usual in the lessons for saints' days, that it cannot be accepted as of good historical authority. This anonymous French legend writer not only makes Hecberct, as he calls him, Alcuin's master, but by way of asserting the tradition turns Egbert himself into a pupil of Bede's and a monk from boyhood and makes Bede live twenty years longer than he did. It is impossible, if Bede had been Egbert's master, that Bede would not himself have referred to this fact in the famous letter of advice which he wrote to Egbert on his becoming archbishop (Bede's *Ecclesiastical History,* ed. Plummer, i. 405), in which he pointedly refers to having stayed with him as a guest and discussed all sorts of political and religious questions with him as a justification for addressing his friend and equal, now become his father in God, in the somewhat puritanical strain he adopts. Had Bede ever held to Egbert the relation of master to pupil, a reference to this would have been a much more direct and effective apology, if indeed any apology at all would be needed. However, the legend writer tells how Hecberct followed in Bede's steps as a teacher. "For from dawn, if there was no obstacle and it was not a saint's day, to the sixth or very often till the ninth hour, sitting on his bed, he opened the secrets of scripture to his pupils as was appropriate to each. Then he got up and said his prayers and mass. And then again towards vespers, when except in Lent, he took a spare but well-cooked meal with his pupils, he did not spare the tongue of the reader, so that he might be refreshed with bread in both kinds. Afterwards you might see the boys in the father's presence, piercing each other with their sharpened weapons, discussing in private what afterwards they would in serried ranks fight in public." This is a picture not of a public school such as that which a busy bishop might have held at York, and Alcuin in the palace school at Aachen, where grammar and literature and logic were taught, but of the aged abbot in the retired leisure of the monastery with a few of the younger brethren learning theology. The picture is inconsistent with a later passage, depicting a real public boarding school, which seems to have been taken from Alcuin's own poem, but transferred from Albert to Egbert, — with whom and Eanbald, Albert's successor, the *Dictionary of Christian Biography* confuses him: "He had indeed a crowd of scholars, noblemen's sons, some of whom were taught and instructed in the rudiments of the art of grammar, others in the discipline of the liberal arts, and some in holy scripture." That Egbert did indeed teach school at York is not to be doubted, since Alcuin himself says so. But neither Alcuin nor Alcuin's biographer represents Egbert as creating or founding the school, any more than Bede represents Theodore and Adrian as founding Canterbury School. Just as Canterbury School must be attributed to Augustine, so York School must be attributed to Paulinus, its first bishop. Indeed, Bede directly bears witness to this by telling us how the song school continued under James the deacon, who stayed in the North during the reaction to paganism which followed on Edwin's death, when Paulinus fled. The cathedral remained, and on Wilfred's coming as bishop in 664, James collected a school of singers round him, while Wilfred himself no doubt taught the grammar school, which then included all learning.

Of Egbert Alcuin simply says that "Wilfred II handed over (in 732) to Egbert the rights of the venerable see when he caused him to be his successor. He was of royal blood and was a most illustrious ruler of this church and an admirable teacher (*egregius doctor*) and ruled for thirty-four years." This matter-of-fact sort of way of speaking of Egbert's teaching entirely negatives any idea of his having founded the school or of his being Alcuin's master, and is in striking contrast to the way Alcuin speaks of Albert (*q.v.*). The school is treated as a going concern, taught by the archbishop as a matter of course. A. F. L.

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Leach, A. F. *Early Yorkshire Schools.* (London, 1899.)
Raine, J. *History of the Church of York.* Rolls Series. (1879.)

EGGLESTON, EDWARD (1837–1902). — Author and educational writer, was educated in the common schools of Virginia; editor of the *National Sunday School Teacher;* author of *Hoosier Schoolboy, Hoosier Schoolmaster, Schoolmaster in Literature,* and several textbooks of history. W. S. M.

EGO — This word has long been used in technical writing as synonymous with the word "self" (*q.v.*). It has been used to distinguish the essence of conscious personality from the physical world or the non-ego. The derivatives of the term are used in popular parlance. The word itself is used for the most part only in technical literature. C. H. J.

EGYPT, EDUCATION IN. — Ancient Egypt. — The Egyptian culture was the product of the Nile Valley. Until very recently our knowledge of Egyptian history reached back only as far as the age of the builders of the great pyramids, and Menes, the traditional founder of the first dynasty, had come to be regarded as mythical. But the pyramids presupposed a high stage of civilization, and the question of its origin was soon raised. A widely accepted theory, and one still held by a number of scholars, regards Egyptian culture as Babylonian in origin. The recent excavations have, however, disproved this claim. We are now able to trace the development of Egyptian culture from its beginnings in the neolithic, even the paleolithic age. By 4241 B.C. astronomical knowledge had developed to such an extent among the inhabitants of the Delta that they were able to introduce a calendar with a year of 365 days. A millennium later Babylonian civilization was still in its beginnings.

The old adage that necessity is the mother of invention is perhaps nowhere better exemplified than in Egypt. Egypt's earliest inhabitants, pushing in from the edge of the desert, found in the alluvial valley of the Nile one of the most fertile areas on the face of the earth. But even after they had subdued the jungle, they were compelled to keep up a continuous struggle with nature, for Egypt is practically rainless, and it is only by making use of the water of the Nile that the soil, ever replenished by the silt deposited by the yearly inundation, is made to yield the abundant returns of which it is capable. The Egyptians early developed an extensive system of irrigation, and were thus able to produce an agricultural wealth sufficient to maintain a population far greater in density than is found anywhere in Europe to-day. This agricultural wealth was the foundation upon which Egyptian culture was built. Egypt has been called the mother of the mechanical arts, and the reason is not hard to find. In Egypt man's ingenuity is taxed to the utmost to devise ways and means for making the best use of his natural assets. Perhaps this explains why it was that the Egyptians never pursued knowledge for its own sake, never cared for the theoretical. Egyptian education remained in all periods intensely practical. One of Egypt's wise men is represented as admonishing his son as follows: "Give thy heart to learning and love her like a mother, for there is nothing that is so precious as learning." He goes on, "Behold, there is no profession which is not governed. It is only the learned man who rules himself."[1] It was because learning gave a man superiority over the unlettered that the Egyptian pursued her so diligently. Learning opened the way to official preferment, while the ignorant man, "whose name was unknown," was "like the heavily laden donkey" and was "driven by the scribe." These scribes, that is, officials, never weary of telling of the superiority of their profession over all others, and not infrequently boast in their tomb inscriptions of how, by their ability, they were able to rise from obscurity to positions of honor at the court.

The Egyptian boy spent the first four years of his life, the years of childhood, with his toys.

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[1] Unless otherwise indicated, quotations are from Erman's *Life in Ancient Egypt.*

Many of these are preserved in our museums, such as a crocodile with movable jaw, dolls with movable arms, a jointed doll representing a slave grinding corn, etc. Theoretically the father was supposed to look after the education of his son, as is shown by the many dialogues of the didactic literature between father and son. But in practice the boy was sent away to school. In the Old Kingdom all of Egyptian life centered about the absolute monarch and his court. Consequently the boys of the wealthy were sent to the schools attached to the palace, where they were educated with the king's sons. The tutor of the princes, who was called their " nurse," was one of the highest officials of the court. A man who later became high priest was brought up by King Menkure "among the royal children in the great house of the king, in the room and dwelling place of the king." This Pharaoh's successor contained to show him favor, and when he had reached the age of manhood gave him " the great royal daughter Ma'atkha to wife." So in the time of the Middle Kingdom a nomarch of Siut relates with pride how he had taken his swimming lessons with the royal children. Another says, " His Majesty seated me at his feet in my youth, and preferred me to all my companions. His Majesty was pleased to grant me daily food, and when I walked with him, praised me each day more than he had the day before." He, too, was given a daughter of the king in marriage. Under the Empire the schools seem to have been attached to the various departments of the government where instruction was given by one of the higher officials to whom the pupils were assigned and under whom they served a sort of apprenticeship. One of these pupils writes to his master, " I was with thee since I was brought up as a child; thou didst beat my back and thy instructions went into my ears." There must have been a large number of these " instruction houses," as the schools were called, to train the vast army of officials who looked after the affairs of the government. The ranks of the officials were recruited largely from the middle class.

Discipline was severe, and there was plenty of flogging. The Egyptians held that by this means they were able to train all animals. " The youth has a back, he attends when it is beaten." " Spend not thy day in idleness, or thou wilt be flogged. For the ears of the young are placed on the back, and he hears when he is flogged." With such precepts as these continually put into practice, it is no wonder that we are told that the children left school, when the noon hour was announced, " shouting for joy." The master saw to it that the boys did not oversleep themselves, thus missing part of lesson time, the results of which, they were taught, " endured forever like the mountains." The boys were sparingly fed: three rolls of bread and two jugs of beer brought daily from home by the mothers constituted the scant fare upon which they had to subsist while they learned their lessons, consisting largely of " instructions " or precepts, among which were such as " Be not greedy to fill thy body," " Share thy bread with others." The boys probably looked upon this severity as a matter of course; their revenge came when they in turn had become masters and flogged their pupils, or when, as official scribes, they had the pleasure of seeing their deputies hale the taxpayers before them while they made the inventories of the assessible property, the probable value of which was usually ascertained only after the administration of sound beatings.

Education in Ancient Egypt consisted largely in the inculcation of ethical precepts, practical philosophy, and good manners. The boys also received instruction in gymnastics and swimming. After they had mastered the art of writing, which must have been an exceedingly laborious task, they were set to work at copying " instructions." One of the oldest examples of the didactic school literature is the *Papyrus Prisse*, dating from the beginning of the Middle Kingdom, but containing the wisdom of Kagemni and Ptah-hotep, viziers respectively of Snefru of the Fourth, and Isesi of the Fifth Dynasty. Among the sayings of this book are the following: " Be not proud of thine own learning, but do thou take counsel with all men, for it is possible to learn from all. Treat a venerable wise man with respect, but correct thine equal when he maintains a wrong opinion. . . . Calumnies should never be repeated. . . . In a strange house look not at the women; marry; give food to thy household; let there be no quarreling about the distribution." Even more detailed is the advice of the instruction dating from the Empire. " Let thine eye be open, lest thou become a beggar, for the man that is idle cometh not to honor. . . . Enter not uninvited into the house of another; if he bids thee enter, thou art honored. Look not around in the house of another. If thine eyes see anything, be silent about it. . . . A man's ruin lies in his tongue. . . . Do not sit down while another stands who is older than thou or who holds a higher office than thine."

But there were other forms of literature which the boys copied and studied. A favorite for almost a thousand years was the story of Sinuhe, written in the Middle Kingdom and telling of the adventures of this nobleman, who, doubtless for political reasons, was compelled to flee the country on the accession of Sesostris I (1980–1935 B.C.), and who, after spending a long time in Syria, was pardoned in his old age by the Pharaoh and allowed to return home.

The time of the Middle Kingdom was the classical age of Egyptian literature. Besides the story of Sinuhe, we have an account of the adventures of the prototype of Sinbad the Sailor (Breasted, *History of Egypt*, p. 203). Fairy tales circulated among the common people, and found expression in literary form

(*Papyrus uestcar*). Events of everyday life were made the subjects of "fine writing," which had now become popular. "*The Tale of the Eloquent Peasant* was composed solely in order to place in the mouth of a marvelous peasant a series of speeches in which he pleads his case against an official who had wronged him, with such eloquence that he is at last brought into the presence of the Pharaoh himself, that the monarch may enjoy the beauty of the honeyed rhetoric which flows from his lips" (Breasted, *op. cit.*, p. 204). This age also developed philosophical works. One of the Berlin papyri (No. 3024) represents an unfortunate, weary of life, arguing with his soul on the advisability of ending their unhappy existence. The opposite extreme is shown in the *Song of the Harper*, which dwells upon the transitory nature of life but advises the fullest enjoyment of it while one may (Breasted, *op. cit.*, p. 206). Professor Erman calls it the national drinking song of the Egyptians. The poetry of this period ranges from simple compositions, such as the *Song of the Threshers*, to hymns singing the praises of the reigning monarch, and showing rigid strophic structure, as *The Hymn to Sesostris III* (Breasted, *op. cit.*, p. 207).

The favorite mode of instruction in the time of the Empire was by means of epistolary correspondence between tutor and pupils in which the former imparted wisdom to the latter and taught him the proper forms of letter writing. A large number of these exercises have come down to us. They are easily recognized by the corrections written by the tutor in the margins. On the back of these letters are frequently found jottings referring to the work in which the pupils were engaged while pursuing their studies; another evidence of the practical nature of Egyptian education, and reminding one of the famous spelling lesson in *Nicholas Nickleby*.

The study of literature was but the means to an end. Thereby facility in writing was acquired and the correct forms and usages of the language mastered. As already indicated, many persons of obscure origin were advanced to high official positions because of the exceptional ability which they showed, but the large majority of scribes remained clerks and secretaries, or overseers of lower or higher rank. The mastery of business and legal forms — bills and accounts, receipts, contracts, wills, deeds, etc. — took up the greater part of the pupils' time. A large number of such legal and business papyri dating from the Old Kingdom were found on the island of Elephantine, and are now preserved in the Berlin Museum.

An interesting papyrus dating from the Middle Kingdom shows the practical nature of the mathematics of the Egyptians. This document contains rules for measuring fields, determining the capacity of a granary, etc. The Egyptian did not have division as we know it. Instead of dividing, he kept multiplying the divisor until he got the dividend. With the exception of ⅔, the only fractions they could handle were those with 1 as numerator. Their rule for determining the area of a circle is worth mentioning. The diameter was taken, one ninth of it subtracted therefrom, and the result squared. The Egyptians studied the heavens. They made charts of the constellations, and by means of extensive tables could determine with considerable accuracy the position of many of them. As we have already seen, their practical knowledge of astronomy had enabled them to introduce a calendar, based upon the heliacal rising of Sirius (Sothis) as early as 4241 B.C., but they never developed any theory of the heavens similar to the Babylonian astrology to be handed down to later times as the highest wisdom.

Medicine was extensively studied and practiced in Egypt. "The medicaments recommended comprise nearly everything which can in some way or other be swallowed, whether in solid, mucilaginous, or liquid form" (Maspero, *Dawn of Civilization*, p. 219). Many of the recipes of Egyptian physicians were borrowed by the Greeks, and one, for determining the sex of an unborn child, found its way into the folk medicine of modern Europe (Paullini, *Neuvermehrter.. heilsamer Dreckapotheke* (1697), see Erman, *Ägyptische Chrestomathie*, p. 48). If it is remembered that it was only with the rise of modern science that hocus-pocus was banished from our own medicine, it will not cause surprise to learn that magic always played the most important rôle in that of the Egyptians.

One must visit the museums of Europe and Egypt to gain an adequate conception of the marvelous technical skill developed by the Egyptians in the carving of wood and ivory, in metal working, in sculpture and painting. Back of the skill of the artisan was the mind of the artist-designer, one of whom, an "overseer" of the "gold house" where the "figures and images of all the gods" were fashioned, tells how he gained the royal favor, and was finally made councilor of the treasury (Breasted, *op. cit.*, p. 245). But the ripest genius of Egyptian culture found expression in architecture. The temples of Egypt have held the admiration of the Greek, the Roman, and the modern world; they are being studied by all students of architecture to-day. The Egyptian architect was a man possessed of all the learning of his day. The first of these of whom we have any record was the wise man Imhotep, learned in priestly wisdom, magic, medicine, and architecture. He was the patron saint of all the later scribes, and "2500 years after his death he had become a god of medicine, in whom the Greeks, who called him Imouthes, recognized their own Asklepios" (Breasted, *op. cit.*, p. 113). In the Old Kingdom the prime minister frequently held the office of chief architect, a thing not unknown in the following periods. To the genius of Ineni, Senmut, Thutiy, Hapuseneb, and others, the architects and favorites of the Pharaohs of the Eighteenth Dynasty, we owe the magnificent buildings of the capital of the Empire.

Finally, a word about the impression the Egyptian learning made upon the Greeks. It was during the restoration of the Twenty-sixth Dynasty that the priests, who were now the only ones who could read them, collected and studied the writings of the past, now regarded as sacred, and read into them meanings which they never possessed. The Greeks accepted these fanciful interpretations all the more readily because of the awe inspired in them by the impressive remains of the material civilization of the Egyptians with which they had become acquainted. Their opinion of the marvelous wisdom of the Egyptians was handed down to modern times and was only shown to be false by the decipherment of the hieroglyph during the last century. D. D. L.

NOTE. — Non-Egyptologists are apt to be confused by the widely divergent systems of chronology found in the different histories of Egypt. This is not the place to discuss this problem; suffice it to say that, in the opinion of the writer, Meyer in his *Agyptische Chronologie* has said the final word on the subject. The dates here appended for reference are taken from Breasted, *A History of Egypt*, pp. 597 f.

Accession of Menes and Beginning of the Dynasties	3400 B.C.
Dynasties I and II (The Thinites)	3400–2980 B.C.
The Old Kingdom, Dynasties III–VI	2980–2475 B.C.
Period of Decline, Dynasties VII–X	2475–2160 B.C.
The Middle Kingdom, Dynasties XI–XII	2160–1788 B.C.
Hyksos Dominion, Dynasties XIII–XVII	1788–1580 B.C.
The Empire, Dynasties XVIII–XX	1580–1090 B.C.
Period of Decline (including Libyans), Dynasties XXI–XXIV	1090–712 B.C.
Ethiopian Supremacy, Dynasty XXV	712–663 B.C.
Restoration, Dynasty XXVI	663–525 B.C.
Persian Conquest	525 B.C.
Egypt seized by Alexander the Great	332 B.C.
Egypt became a Roman Province	30 B.C.

Modern Egypt. — Modern education in Egypt is the product of two agencies: the missionary, and the European powers that have had control of the political affairs of the country. The population is mixed as regards racial origins and religious beliefs, but the vast majority of the people, 91.8 per cent, or a total of 11,207,359, are Moslems; Christians, adherents of the Coptic and Greek churches, form 7.8 per cent; Jews .34 per cent. Apart from the necessity of raising an annual tribute for the Sultan's treasury, the Khedive is supreme in Egypt, save for the authority exercised by the English adviser, whose sanction is required for every financial act of the government. This authority was conferred by the Khedive in 1883, at which time the system of two controllers-general, one English, the other French, which had been adopted in 1879 by agreement of the European powers, was discontinued. Down to 1883 French influence predominated in the system of modern education; since that year, it has given way to the English influence.

The existing provision for education in Egypt consists of native schools, many of which have a very ancient history, and modern schools. Efforts have recently been made to obtain a complete survey of schools and higher institutions and to bring the elementary schools, both native and foreign, under a measure of government supervision. As a consequence, the educational statistics of Egypt, in regard to system and completeness, compare very favorably with those of the most advanced European nations. In the reports on the subject issued annually by the director of the statistical department, the schools are classified under the following heads: (1) government schools; (2) government kuttabs (vernacular elementary schools); (3) kuttabs under government inspection; (4) other Egyptian schools; (5) foreign schools.

The government schools owe their origin to Mohammed Ali Pasha, who was appointed governor of Egypt in 1806, and made himself master of the country by force of arms in 1811. In 1841 Mohammed Ali was recognized as Viceroy under the guarantee of the five great European powers. Convinced of the superior value of Western education as compared with the system of his own country, this ambitious ruler established schools modeled on those of Europe for the purpose of training Egyptian students for careers in the different branches of the public service. In the last decade these schools have increased in number, and at the present time they form a system, including primary and secondary schools, colleges, and technical institutions, in all of which instruction is given partly through the medium of a European language. Formerly an English side and a French side were both included in the government schools; but within the last few years the number of pupils in the latter has been steadily decreasing, and in many cases the French division has been discontinued. When first established, the government schools were not only free, but the students were boarded and clothed at public expense; under Ismail Pasha (1863–1879), the fourth Khedive in direct descent from Mohammed Ali, students received money allowance from the government. This gratuity ceased, however, in 1874, since which time fees have been charged.

The foreign schools are also modern, and are either missionary schools or are maintained by European governments in the interests of their own people in Egypt. The schools which are classified as Egyptian are Moslem schools, or schools pertaining to the native Christian churches, *i.e.* Greek and Coptic. The language of instruction in these schools is generally Arabic, and the teaching is mainly directed to religion.

The number of pupils enrolled in all classes of schools at the date of the last report (1908) was 288,445 (249,226 males; 30,719 females). Of the total number, 175,515 attended the kuttabs. The following table shows the distribution of the remaining 113,430 pupils.

NATIONALITY	SCHOOLS	TEACHERS	PUPILS
Egyptian	326	3,147	66,049
English	25	153	2,287
American	156	410	12,640
Austrian	10	68	1,647
Dutch	2	7	159
French	137	1,185	17,805
German	5	60	822
Greek.	32	154	5,774
Italian	40	267	5,766
Other.	2	24	481
Total	735	5,475	113,430

Very nearly half the above schools, 336, and more than half the pupils, 68,378, were reported from Cairo, Alexandria, and the three canal towns, Port Saïd, Ismailia, and Suez. The modern schools maintained by the Egyptian government in 1908 were as follows: —

SCHOOLS		NUMBER OF STUDENTS	
Class	Number	Egyptians	Foreigners
Primary	38	8,481	75
Secondary	4	1,897	12
Teachers' Training. .	10	867	2
Technical and Special .	10	1,572	55
Higher	5	665	4
Total	67	13,842	148

The higher schools include the following: —

DESIGNATION OF SCHOOL	NUMBER OF STUDENTS
Law	390
Medicine	155
Cadis (Magistrates)	14
Engineering	102
Chemistry	4

In addition to the government schools, the French maintain at Cairo one higher school for young men, which in 1908 had 295 students. The American schools comprised in the table showing nationality are in charge of the American Mission, and are chiefly primary, but this organization maintains a college for girls at Cairo which has generally between sixty and seventy students. The remaining higher institutions are native, following the traditions, doctrines, and methods of the various religious sects. The largest and most important of these is the University at Cairo, El-Gama el Azhar University, with 9940 students and 329 teachers. This is the oldest institution in Egypt, founded in 972, and one of six higher institutions having a total of 15,000 students maintained by the Waqfs administration, or religious endowments pertaining to the mosques. Beside the six higher institutions, the Waqfs administration maintains thirty-one primary schools, with nearly 2000 pupils.

One of the most important efforts on the part of the Egyptian government in respect to education is the maintenance of day and evening technical schools. The foreign authorities have also engaged largely in this work. Altogether there were in 1908 four technical evening schools maintained by the government at Cairo, and six foreign evening schools of the same class distributed between Cairo, Alexandria, and the canal ports. These schools enrolled 912 students, of whom 273 were natives. There were also the same year 12 day technical schools with 726 students. There are several flourishing commercial schools in charge of French clerical orders.

From time immemorial indigenous schools, kuttabs, have been scattered throughout Egypt; some are attached to mosques, others are maintained by pious trusts, and some are purely private. It was not until 1897 that an endeavor was made to bring these rudimentary schools within the sphere of departmental supervision. Following English precedents, this was done by a system of inspection and awards of which the schools might avail themselves. Government aid was made dependent in each case upon daily instruction in the three elementary subjects, apart from any religious teaching, combined with the report of the government inspector as to the general condition of the school. The growth of the system is shown by the following statistics: —

YEAR	NO OF PRIVATE KUTTABS INSPECTED	NO. OF PUPILS			NO. KUTTABS SECURING GRANTS	TOTAL GRANT
		Boys	Girls	Total		
1898	301	6,938	598	7,536	110	$2,475
1909	3581	174,023	16,852	190,875	3054	12,395

A staff of three inspectors and thirty-six sub-inspectors, several of whom are English, is maintained by the Ministry of Education in the exclusive interest of this work. There are also 143 kuttabs under the immediate control of the ministry, with about 1200 pupils. This brings the total number of pupils in supervised kuttabs to 202,000. While the instruction is given in the vernacular tongues, the endeavor is made to use modern methods, and, as far as the limited scope of the schools permits, to impart modern ideas.

In the statistical reports the schools are arranged under the different local divisions, namely: the five governorships (*mohafzas*) of principal towns, and the fifteen provinces (*mudirias*), which are subdivided into districts (*kisms*). From this presentation it is seen that while the modern schools are confined almost exclusively to the towns, the inspected kuttabs are increasing in the provinces and even in the remoter districts. The government maintains four training colleges, three for men and one for women, to prepare teachers for the kuttabs, and also weekly classes at thirty centers for the benefit of teachers already engaged in schools of this class. The expenditure for the vernacular schools rose from $14,820 in 1898 to $348,650 in 1908. The total expenditure for education by the ministry in the latter year was $2,225,000.

A. T. S.

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EIGHTEENTH-CENTURY EDUCATION IN ENGLAND. — Broadly speaking, it may be said that the whole of the eighteenth century was a period of preparation for the great activities in all branches of education that began to operate at the opening of the nineteenth century. From the beginning till near the end of the eighteenth century there was on the one hand a process of declining administrative and teaching efficiency in all branches and grades of education and on the other the sowing of seeds that were destined to produce enormous harvests. Thus elementary education, as represented by small endowed schools, charity schools, and workhouse schools, grew less and less efficient, but in fact we find in the early part of the century a great multiplication in the number of those schools, and in the latter part of the century they were supplemented by Sunday schools and at the very end by monitorial schools. Again the numerous endowed grammar schools were fairly efficient during the first quarter of the century, but after that date a steady decay set in that no effort seemed able to stop. By 1750 the grammar schools, except in very special cases in growing towns or famous centers of learning, were becoming less and less efficient, and the attendance smaller and smaller. The masterships and even the usherships became in numbers of cases sinecures, and the endowments of the schools were shamelessly abused. The Court of Chancery (*q.v.*) and the Commissioners of Charitable Uses created by Queen Elizabeth made efforts to check the disease, but the system of appeals and the terrible cost of the proceedings made little progress possible. Certain great ecclesiastics, such as Dr. Markham, Archbishop of York, at one time the Headmaster of Westminster School, did something to improve matters, but the position as stated by Lord Kenyon, Chief Justice, in 1795 shows how complete was the failure of secondary education at that date: "Whoever will examine the state of the grammar schools in different parts of this kingdom will see to what a lamentable condition most of them are reduced, and would wish that those who have any superintendence or control over them had been as circumspect as the Archbishop of York has been on the present occasion. If other persons had equally done their duty, we should not find, as is now the case, empty walls without scholars, and everything neglected but the receipt of the salaries and emoluments. In some instances that have lately come within my own knowledge, there was not a single scholar. in the schools though there were very large endowments to them" (*The King* vs. *the Archbishop of York. Term Reports*, vol. VI. p. 490). On the other hand, the schools that remained efficient, such as Eton (*q.v.*), preserved a very high standard of classical scholarship, and this standard was likewise maintained at the universities. Moreover in an age of change the schools were in fact preserved intact ; their endowments were not lost or turned to other and lower uses. The vast secondary system was preserved, and is to-day at last reaching a remarkable degree of efficiency. In the universities, too, the teaching efficiency steadily declined until the first, the Oriel, revival at Oxford toward the end of the century. Adam Smith, writing in 1776, says, "In the University of Oxford, the greater part of the public professors have for these many years given up altogether even the pretence of teaching." Things were as bad at Cambridge.

Yet in this period we find at both universities that the mighty classical tradition was preserved intact, and famous lecturers, such as Blackstone at Oxford, still lectured. Richard Porson (*q.v.*) (1759–1808), perhaps the greatest of all English scholars, was educated at Eton, adorned Oxford and Europe in this period, and produced a new text of Euripides, while both universities produced scholars and authors of the highest gifts. Moreover, it was in 1747–1748 that the Cambridge Mathematical Tripos was founded at Cambridge, and no less than twelve Cambridge professorships were founded in the eighteenth century. Both universities were saved for their great work of the nineteenth century, work of light and leading for the entire western world. The eighteenth century was a period in English education for which it is difficult to account.

J. E. G. de M.

Other and more special phases of this subject are treated more fully under separate topics, such as CHARITY SCHOOLS; ENLIGHTENMENT; SUNDAY SCHOOLS; WORKHOUSE SCHOOLS, etc.; under biographical articles such as CHESTERFIELD; DEFOE; MANDEVILLE; PORSON; under the title of societies, as EDUCATIONAL ASSOCIATIONS, etc.; also the articles on CAMBRIDGE UNIVERSITY; ETON COLLEGE; GRAMMAR SCHOOLS; OXFORD UNIVERSITY; PUBLIC SCHOOLS; UNIVERSITIES, etc.

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EINHARD, or EGINHARD (*c.* 770–840). — Biographer of Charlemagne and a leading classical scholar of the early Middle Ages. After receiving his early education at Fulda, Einhard was sent to the school of Alcuin (*q.v.*), where his ability in mathematics and architecture attracted attention. He was appointed private secretary, and was also given the supervision of buildings, including the cathedral and palace at Aachen. He was also sent on diplomatic missions by the Emperor. He continued to enjoy royal favor after the death of Charlemagne, and was given several abbeys and fiefs by Louis the Pious. He himself founded a monastery at Mühlheim, which he named Seligenstadt. His influence was exercised mainly in Belgium, where most of his abbeys lay. He corresponded with the best classical scholars of his day, among them being Servatus Lupus of Ferrière. His best known work is the excellently written *Vita Caroli Magni*, which is frankly an imitation of Suetonius' *Vita Augusti.* His interest in architecture led to the study of the work of Vitruvius. His other works, which show evidence of wide classical reading, include *Translatio et Miracula SS. Marcellini et Petri*, and *Epistolæ.* In one of his letters to his son he expresses his belief that the young must be disciplined to walk in the ways of righteousness, that insight and morality go together, but that knowledge without humility leads to nothing but arrogance.

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EISELEN, ERNST WILHELM BERNHARD (1792–1846). — One of pioneers of gymnastic instruction in Germany. Born in Berlin, he attended the Graue Kloster Gymnasium, and become a favorite disciple of Jahn (*q.v.*). Being unable on account of his poor health to take part in the Wars of Liberation, he took charge of Jahn's open-air gymnasium in the Hasenheide, near Berlin, until 1820, when gymnastics fell under the official ban in Prussia. During the time of Jahn's imprisonment he continued to work for the cause of gymnastics, and in 1827 he succeeded in obtaining the permission of the authorities to open a private gymnasium, which, at that time, was almost the only training school for teachers of physical training in Germany. With Jahn, Eiselen published in 1816 the *Deutsche Turnkunst.* F. M.

EITELBERGER, RUDOLF (1817–1885). — A prominent representative of industrial and art education in Austria; was born in Vienna. In 1852 he became professor of the history of art in the University of Vienna. On the model of the Kensington Museum, he founded the Austrian Museum of Art and Industry in Vienna, which he directed until his death. This institution, one of the best of its kind, has exerted a great influence on art-artisanship throughout Austria. Through the efforts of Eitelberger the methods of art teaching in the industrial and other schools of Austria were greatly reformed. F. M.

ELABORATION. — A form of exercise used in the teaching of English composition. The student is given a few suggestive words or phrases, or an analytical outline, and told to extend it into an essay, description, or narrative. H. S.

See LANGUAGE, ENGLISH, TEACHING OF; COMPOSITION.

ELDON, LORD, AND EDUCATION. — The influence of Lord Eldon, the famous Lord Chancellor and brother of the great international jurist, Lord Stowell, on English education through his decisions was a retarding, but probably on the whole, a good influence. He set his face firmly and successfully against the attempt made at the beginning of the nineteenth century to convert derelict secondary or grammar schools into primary schools. His decisions seemed hard at the time, but his policy was a right one, for the country could not afford to lose in the long run a single grammar or secondary foundation. Lord Eldon, however, in the strictness of his construction of educational trusts, went too far. On July 22, 1805, he held in the case of *Attorney-General* vs. *Whiteley* (Vesey's *Chancery Reports*, Vol. XI, p. 241) that the foundation in question being a free grammar school at Leeds for teaching grammatically the learned languages, the Court was bound to refuse to permit the allocation of part of the funds to procure masters for French and German, or to create a subsidiary establishment with a view to commercial teaching. But in the case of *Attorney-General* vs. *Earl of Mansfield*, decided many years later (1826–1827), Lord Eldon held that where a school ought to be a grammar school for instruction in the classics, the trustees would not be permitted to convert it into a school for teaching merely English writing and arithmetic, even though it had ceased before the time of living memory to be a place for classical instruction, and though it appeared from old regulations that elementary instruction in English had always been one of the subjects of the school. Lord Eldon rightly declined to allow the character and scope of the school to be altered. To-day his conservative stand against a misapplication of the *cy-près* doctrine is a matter of thankfulness. After the date of these decisions the curriculum in grammar schools under the influence of Lord Lyndhurst became more elastic, but by that time it had become difficult to convert a grammar school into a school of a lower grade. It should be noticed that Lord Eldon in the House of Lords (Aug. 11, 1807) opposed Mr. Whitbread's Bill for the Education of the Poor. The Bill proposed that the poor children of each parish should be entitled to receive two years' education between the ages of seven and fourteen years, and provided machinery to render this possible. The Bill in its passage through the Commons was deprived of its compulsory character, and became merely adoptive, though still retaining the principle of raising the necessary money by means of rates. Lord Eldon opposed this bill when it reached the House of Lords, though he was in favor of improved educational conditions. The bill was in fact hardly a practical measure and was not likely to attract the support of the very practical Lord Chancellor.

J. E. G. de M.

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ELECTIVE SYSTEM. — See College, the American (Section on *Administration of the Curriculum*); High School, Elective System in.

ELECTRICAL ENGINEERING. — See Technical Education.

ELEMENTARY MATHEMATICS. — This is a term loosely used to designate either (1) the mathematics of the elementary school (*q.v.*), usually simple arithmetic and the mensuration of common figures, or (2) the mathematics preceding the theory vaguely styled "higher mathematics." As used in the second of these senses in the United States, the term usually includes simple commercial arithmetic, algebra through geometric progressions, plane and solid geometry, plane and spherical trigonometry, advanced algebra (usually with a little of the theory of equations), plane analytic geometry, and the elements of the differential and integral calculus. These subjects represent approximately the work of the elementary and secondary school, and of the first two years of the American college. D. E. S.

See Arithmetic; Algebra; Geometry.

ELEMENTARY SCHOOL TEACHER. — See Journalism, Educational.

ELEMENTARY SCHOOLS. — A general term applied to the first eight years of the public school course of study. The term is now applied to all of the different grades above the kindergarten and below the high, or secondary school. It is a general and a comprehensive term, which has gradually come to supplant and to include the old terms of primary school, intermediate school, and grammar school. For greater convenience some school systems still subdivide their elementary school system into primary and grammar schools, and, in the North Atlantic group of states, the term "intermediate school" is frequently still retained to designate the upper primary and the lower grammar grades of the elementary school. E. P. C.

See Abecedarian; Grammar Schools; Petty Schools; Public Schools.

ELEMENTARY SCIENCE. — See Botany; Nature Study; Science; Zoölogy, etc.

ELEMENTS OF CONSCIOUSNESS. — Certain writers on psychology regard it as the chief business of this science to analyze complex conscious processes into their irreducible elements. Thus the perceptual experience of seeing an object can be resolved into sensations of color, muscle sensations, and memory elements from past experience. Skill in such analysis is regarded by some as the chief end of psychological training (Titchener). Educational discussions have often been built upon the basis of such analyses, the contention being, as Pestalozzi held, that it is necessary to supply the elements of an experience in order that the experience itself may be developed. An extreme illustration of attention to elements of consciousness appears in the contention that training in the alphabetical elements of a word is the necessary preparation for the recognition of the word itself. In recent educational discussions there has been a tendency to emphasize not the elements of the process, but rather the synthetic combination of these elements in a single whole. The recognition of a word has been treated as a complex which contains elements, but which from the point of view of the teacher should not be treated so much as a series of elements as the complex organized whole. The distinction between purely analytical or structural treatment of mental processes and the functional consideration of these processes has been emphasized in recent writing. C. H. J.

See STRUCTURAL AND FUNCTIONAL PSYCHOLOGY.

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ELIMINATION OF PUPILS FROM SCHOOL. — See RETARDATION AND ELIMINATION OF PUPILS; also GRADING AND PROMOTION.

ELIOT, JOHN (1604–1690). — Apostle to the American Indians; taught school in England for nine years after his graduation at Jesus College, Cambridge, in 1622. He came to America in 1631; learned the Indian languages; engaged in religious and educational missionary work among the native races, and translated the Bible and many other books into their tongue. He was the author of the *Logical Primer* (1672), an *Indian Grammar* (1666), and numerous religious works. He was one of the authors of the well-known *Bay Psalm-Book.* W. S. M.

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ELIOT, SAMUEL (1821–1898). — Author of books for children; was graduated at Harvard College in 1839, and spent three years thereafter in travel in Europe. Upon his return he engaged in educational missionary work among the vagrant children of Boston. He was professor of history and social science in Trinity College from 1856 to 1860, and president of the institution from 1860 to 1864. He was headmaster of the Boston Latin School from 1872 to 1876, and superintendent of the schools of Boston from 1878 to 1880. Author of a history of the United States, several reading books for children, and papers on social science and the education of the blind. W. S. M.

ELIOT, WILLIAM GREENLEAF (1811–1887). — University president; graduated from Columbian University at Washington, 1831, and from the Harvard Divinity School, 1834. He was active in the establishment of the public school system of St. Louis (*q.v.*), and was chancellor of Washington University from 1872 to 1887. Author of *Early Religious Education* (1855), and other works.
W. S. M.

ELIZABETH COLLEGE, CHARLOTTE, N.C. — An institution for the liberal education of women, maintaining preparatory, collegiate, commercial, music, art, expression, and physical culture departments. Twelve points of high school work are required for entrance into the college, certificates of approved schools being also accepted. The A.B. degree is conferred. There is a teaching staff of twenty-three members.

ELIZABETHAN PERIOD IN ENGLISH EDUCATION. — Queen Elizabeth succeeded to the English throne on Nov. 17, 1558; her reign ended with her death on Mar. 24, 1603. No period of equal importance in the history of English education (if that education be taken as a connected whole) is to be found until the organized revival of national education during the second half of the nineteenth century. Though Henry VIII and his son Edward VI were both scholars and lovers of scholarship, and in various ways endeavored to aid and to make more efficient the university grade of education; though in the reign of Edward VI something was done toward preserving a certain proportion of the grammar schools that reckless legislation had overtaken; yet the net results of those two reigns was to leave the country without the educational machinery that existed at the opening of the sixteenth century. Elementary schools as well as grammar schools had disappeared, and the universities were not only inefficient, but were the resorts of the vicious and idle.

The loss through the dissolution of monasteries and charities was enormous, and it was the business of the reign of Queen Elizabeth to substitute new educational facilities. Parliament felt from the first that the losses had been intolerable. Sir Thomas Smith in 1548 introduced into the Commons a school bill. Thomas Williams, Speaker of the House of Commons, in 1563 said, "I dare say a hundred schools want in England, which before this time have been: and if in every school there had been but an hundred scholars, yet that had been ten thousand; so that now I doubt whether there be so many learned men in England, as the number wants of these scholars." Williams much underestimated the loss of grammar schools, and two hundred at least had disappeared. Yet by the year 1581 the loss had been made up. Richard Mulcaster, writing in that year, said, " We have no great cause to complain for number of schooles and founders. For during the time of her Majesties most fortunate raigne already, there hath been mo schooles erected, than all the rest be, that were before her time in the whole Realme. My meaning is not to have so many, but better appointed both for the maisters' entertainment and the commoditie of the places " (*The Positions*, p. 327). Indeed, an examination of the material shows that in Elizabeth's reign one hundred and eight grammar schools were founded and twenty-seven were additionally endowed, while forty nonclassical schools were founded and seven were additionally endowed.

Elizabethan legislation on the subject of education requires special notice. All repetition of the educational disasters caused by the dissolution of the monasteries and the chantries was prevented by an act in the first year of the Queen's reign (1 Eliz. c. 24) which dealt with certain monasteries and chantries, but which reserved (section 9) from annexation lands and property limited or appointed by any of the annexed corporations " to any Scole Master or to the finding of any Scole or Scolers to lerning." Section 10 preserved from the operation of the act colleges and chantries in the universities or " any Chantrey founded in any other place for the mayntenaunce of a Gramer Scoole or lerning or where the Chantrye Preest is also appointed to teache children." An act of the same year (c. 22) enabled the Queen to make statutes, ordinances and rules for existing schools. But the Queen was also determined to secure the Protestant character of all schools and of the universities. The very first act of her reign (1 Eliz. c. 1, s. 12) made it necessary for every person taking a university degree to take the oath admitting the supremacy of the Crown in all matters spiritual and temporal. In the Royal Injunctions of 1559 (II, 40) the Ordinary was given the power to issue licenses to school teachers, and the Church followed this principle with assiduity. Convocation of the Province of Canterbury in 1571 laid down the rule that a license to teach was necessary, and. added " that the Bishop shall approve no schoolmaster as worthy of the office of teacher, unless, in his judgment, he has sufficient knowledge" (*nisi quem suo judicio doctum invenerit*) " and unless he is recommended as worthy in life and morals by the testimony of pious men." (See also Archbishop Grindal's Injunctions [45] for the Province of York, 1571.) In 1580 the Privy Council ordered an inquisition into the religious opinions of all teachers and tutors, and from 1581 to 1588 special episcopal inquiries were made as to unlicensed teachers. Prosecutions for teaching without a license occurred. Thus on May 1, 1584, a true bill was returned against William Smithers for keeping a common school in the Charterhouse without a license (*Middlesex Sessions Rolls*, Vol. I, p. 149). By statute in 1581 (23 Eliz. c. 1, s. 5) every schoolmaster had to be licensed and to attend church as provided by the act under a penalty of one year's imprisonment. These regulations and laws answered their immediate purpose, and in fact raised education to a high standard of efficiency, though a century later they led to a great and disastrous reaction. But in Elizabeth's time it was not only the religious, but the secular side of education that was enforced by the State. Almost immediately after the Queen's accession, a Royal Injunction was issued (II, Art. 39), which ordered that " every schoolmaster and teacher shall teach the grammar set forth by King Henry VIII of noble memory, and continued in the time of King Edward VI, and none other." The Church took up this lead. Archbishop Parker's *Articles of Visitation* of 1567 carefully inquired into the whole life of the grammar schools, and similar articles are found in succeeding years. Moreover, the Queen did not allow other necessary economic legislation to interfere with school attendance. The compulsory service of young persons contemplated by the Statute of Apprentices of 1562–1563 (5 Eliz. c. 4) was not to extend to " a Student or Scoler in any of the Universitees or in any Scoole." Every effort was made that the schools and the teachers should not be hampered. The schoolmasters, says Strype (in his *Annals of the Church under Queen Elizabeth*), were " commonly freed from taxes and ordinary payments, and had exemption from personal services commonly charged upon other subjects." No school or school property was charged with tenths or first fruits (1 Eliz. c. 4, s. 40 giving a general extension to the same provision created by 27 Hen. VIII, c. 42) for the universities and for Eton and Winchester. The act which confirmed the subsidies of the clergy (5 Eliz. c. 24) exempted the universities and every grammar school from the tax (s. 20). Moreover, schools were exempted from all aids granted to the Crown by Parliament from the time of Edward VI to 1763.

But these various provisions in aid of schools are slight as compared with the determined effort made by Queen Elizabeth to deal with the corruption and abuse of endowments that had steadily increased throughout the sixteenth century. The Reformation had destroyed innumerable endowments for education, but it had reformed few, and the universities themselves had, despite the danger that they ran, grown corrupt in the extreme. Henry VIII had attacked some of the university abuses vigorously in 1536 (28 Hen. VIII, c. 13), and positively forbade beneficed clergymen over the age of forty to remain in the university, and none under the age of forty who did not attend lectures. In 1571 Queen Elizabeth incorporated both Oxford and Cambridge in order to promote "the mayntenaunce of good and Godly literature, and the vertuose Education of youth within either of the same Universities." But the state of corruption continued, and William Harrison (1586) declared that it had become impossible for poor men's sons to win scholarships or fellowships. Bribery determined even the grammar school scholarships to the universities. Elizabeth had already dealt by an act of 1575–6 (18 Eliz. c. 6) with the financial position of the university colleges, and placed them upon a sound basis that made corrupt dealings with the rents of the college lands impossible; and now her heavy hand came down on the abuse of fellowships and scholarships. By an act of 1598–9 still in force (31 Eliz. c. 6) which recited that "the intent of the founders of Colledges Churches Collegiats, Churches Cathedral, Scoles, Hospitals, Halles and other like Societies within the Realm" to have "the fittest and most meet persons" elected to fellowships and scholarships without gift or reward had been neglected, and that the fittest persons were "sildome or not at all preferred . . . to the great prejudice of Learning and the Common Wealthe and Estate of the Realme"; the statute imposed forfeiture upon him "who taketh reward for his voice in such elections." The act was certainly effective, for in a few years the universities swarmed with students, and in 1612 there were nearly as many in residence as there are now. But the attack on corrupt practices did not cease with these measures. The endowments, as well as the use of the endowments, had to be protected, and in 1597 a statute confirmed and extended in 1601 (39 Eliz. c. 6 and 43 Eliz. c. 4) created a body called the Commissioners for Charitable Uses, which had power to inquire into abuses of charitable bequests or donations and to rectify the same by decree. By this body (which remained in existence as late as 1888) some thirty-three schools were reformed. The system of appeals under the act, however, sadly marred its efficiency in the period when its need again became urgent in the eighteenth century. It is interesting finally to note that in the reign of Queen Elizabeth the idea of education at the cost of local authorities came to life. In the year 1561 the overseers of the city of Westminster were paying for elementary teaching, and in 1586 paid a part of the expenses of John Creverne at Oxford. The history of rate aid in education dates from about this period. The importance of the Elizabethan period in the history of every branch of education can hardly be overestimated, though, strangely enough, it is only modern times that have reaped the full fruit of the seed then sown. J. E. G. de M.

See Apprenticeship and Education; Cambridge University; Chancery, Court of; Chantry Schools; Edward VI and Education; Monastic Education; Oxford University; Reformation and Education.

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ELIZABETHTOWN COLLEGE, ELIZABETHTOWN, PA. — A coeducational institution established in 1900 by the Church of the Brethren (German Baptist) of eastern Pennsylvania. Academic, pedagogical, commercial, industrial, music, and biblical departments are maintained. The institution does not grant degrees, but is affiliated with degree-granting colleges. There is a faculty of seventeen teachers.

ELLIS, WILLIAM (1800–1881). — Economist, founder of the Birkbeck schools, and advocate of systematic instruction in social economy. Descended from a French Huguenot family (named De Vezian), Ellis, in his fourteenth year, entered the office of his father, a marine underwriter in London. In 1820 he became acquainted with Jeremy Bentham (*q.v.*) and James Mill, and formed an intimate friendship with John Stuart Mill (*q.v.*), of whose Utilitarian Society, founded in 1822, he was one of the first members. In 1824 he was appointed assistant manager of the Indemnity Mutual Marine Insurance Company, in the service of which (as chief underwriter, 1826–1876) he continued till his death. Throughout an arduous business career he devoted his leisure and a large part of his fortune to disinterested labor for school reform and to experiments in education. His main purpose was to give the course of instruction in elementary schools a direct bearing upon the pupils' future duties in life, with a view to the strengthening of personal character and to the creation of a higher ideal of citizenship. He therefore advocated the introduction into school curricula of systematic courses of moral instruction, connected with the teaching of physical science, but mainly resting upon the principles and applications of political and social economy. In furtherance of his purpose he (1) wrote a series of handbooks on social economy for teachers and for pupils of different ages; (2) himself gave, in elementary schools and in training classes for schoolmasters, courses of lessons in social economy and in civic duty; and (3) founded in London and largely maintained from his private resources a number of schools in which the moral and economic instruction followed the principles and methods enjoined by him.

Ellis's works were designed to inculcate "the three great duties of social life: First, to strive to be self-supporting and not to be a burden on society; second, to avoid making any engagement, explicit or implied, for the due performance of which there is no reasonable prospect; third, to make use of all superior advantages, whether of knowledge, skill or wealth, so as to promote to the utmost the general happiness of mankind." As a teacher, Ellis had remarkable gifts, especially excelling in the Socratic method of questioning and in the lucid exposition of complex economic facts. Florence Nightingale, who attended one of his classes, wrote long afterwards that his was the best and most effective teaching she had ever heard, bringing the most difficult subjects in an absolutely clear and most living way to the understanding of a child. In 1846 he began to give lessons in social economy to the children in some British schools in Camberwell, London. For many years he devoted much of his leisure to giving instruction in social economics, both in schools and to classes of schoolmasters. In 1855, at the request of the Prince Consort, Ellis gave courses of instruction in social economy to the Princess Royal (afterwards the Empress Frederick of Germany), the Prince of Wales (afterwards King Edward VII), the Princess Alice (afterwards Grand Duchess of Hesse-Darmstadt), and Prince Alfred (Duke of Edinburgh). The lessons left a deep impression upon the pupils, especially upon the Empress Frederick. In 1859, under the auspices of the Science and Art Department, Ellis gave lectures at South Kensington upon the teaching of social economy as a branch of school education.

For many years Ellis was munificent in his contributions to the support of schools in which systematic instruction was given in social duty. In 1846 he liberally helped William Lovett, the leader of the moral force Chartists, to secure the equipment and a master for an elementary school in the National Hall, opened by the London Working Men's Association in Holborn, and for nine years continued the pecuniary aid without which the maintenance of that school would have been impossible. In 1848 he established (with the help of his trusted coadjutor, John Rüntz) a school for boys in the buildings of the Mechanics' Institution in Southampton Buildings, Chancery Lane (now known as the Birkbeck College, in Bream's Buildings). The Birkbeck School was so named in memory of the founder of mechanics' institutions, who had died in 1841. The first Birkbeck school was closed in 1873, owing to defects in the school buildings. But in the meantime many other schools on the same principle had been founded in different parts of London (viz. in Finsbury, Westminster, Bethnal Green, Peckham, Kingsland, and Gospel Oak), some by Ellis himself, and others by friends with his assistance. His purpose was to establish models in different districts of London in order to induce other school managers to adopt his methods of teaching.

Ellis stands out as a striking figure in the educational history of mid-Victorian England. Throughout the absorbing duties of a life spent in commerce, in which he was eminently successful and highly respected, he kept undimmed the flame of intellectual passion which had been kindled in his early intercourse with the Benthamite circle. To him the laws governing human action and regulating social activities were not simply statements of scientific fact, but the revelation of moral truth. He himself found in them inspiration for right conduct, and desired to bring the knowledge of them not only to the mind, but to the heart of the nation. He had inherited the Calvinist passion for a clear intellectual interpretation of life. Social and economic science had for him the authority which his forefathers found in the Bible. He practiced with consistency the doctrines which he himself taught to others and wished to see incorporated in the course of study of every school. He denied himself the indulgences of wealth in order that he might spend largely, though unobtrusively, upon the furtherance of his educational ideals. The honesty of his thought and the thoroughness of his knowledge gave power to his teaching and weight to his advice. In spite, however, of the success of his schools and the acknowledged value of his instruction, his influence upon the educational practice of his time was limited, and his name comparatively obscure. This is partly explained by Ellis's uncouthness as a writer and by his misjudgment as to the finality of some of his economic presuppositions. But the record of his life and work points to a deeper cause of his relative failure. He was a pioneer of the movement for systematic moral and social instruction in elementary schools, and in this respect was before his time. But he lived through a period of confused transition in both the economic and political structure of English life. The old economic order from which he drew the materials of his instruction was slowly giving way to new conditions, not yet defined enough to furnish a firm foundation for the concise and clear-cut instruction which he regarded as indispensable for the elementary school. Ellis did not overstate the educational influence of systematic social instruction, but he overrated the certainty of some of the economic doctrines which he desired to inculcate. His educational theory presupposed a generally accepted social ideal. But he lived at a period in English history when no one social ideal commanded general acceptance. Consequently, courses of instruction which to his mind had an almost religious solemnity appeared to many of his contemporaries sterile or inadequate. For educational use, Ellis's thought was lacking in poetry and imagination. The intellectual and civic enthusiasm which, in his own case, supplied this defect were not always communicable by him, and still less by others, through the course of economic instruction which he planned. His greatness lay in his gift as a teacher, in his intellectual sincerity, and in his self-denying passion for social welfare. M. E. S.

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ELLSWORTH COLLEGE, IOWA FALLS, IA. — A coeducational institution, which received its present name in 1890 in honor of its principal donor. It maintains a college of liberal arts, school of education, school of commerce, conservatory of music, and schools of art and oratory. Students are admitted to the college on certificates from approved high schools and academies. The degrees of A.B., Ph.B., Sc.B., are conferred after the appropriate studies. There is a teaching staff of eighteen professors.

ELMIRA COLLEGE, ELMIRA, N. Y. — A college for the education of women founded in 1851 and located by charter in 1852 at Auburn as the Auburn Female University. The institution was transferred in 1853 to Elmira, and was chartered in 1855 as the Elmira Female College. The course of study from the first was made equivalent to that given in the best colleges for men. Admission is by certificate of the Regents of the University of the State of New York, the College Entrance Diploma of the State Education Department, and certificates from approved schools, or by examination, the requirements being fourteen units of high school work. The A.B. and B.S. degrees are given, the latter in household art, secretarial and finance and in music and literature as well as in the scientific course. The college has productive funds of $200,000, and a total income, including tuitions, of $60,000. The total number of students in 1909–1910 was 287. The faculty includes eighteen members.

ELOCUTION. — See DEBATING; DECLAMATION; ORATORY.

ELON COLLEGE, ELON, N.C. — A coeducational institution founded in 1888 by the General Convention of the Christian Church South, and opened in 1890. Preparatory, collegiate, commercial, and music and art departments are maintained. Candidates may enter by certificate from schools or by examination, the entrance requirements being equivalent to fourteen points of high school work. The degrees of Bachelor of Arts and Bachelor of Philosophy are conferred on completion of the appropriate courses. The faculty numbers fourteen.

ELSTOB, ELIZABETH (1683–1756). — The writer of the first English-Saxon (Anglo-Saxon) grammar; born at Newcastle-on-Tyne in 1683. Her mother died when Elizabeth was eight years of age. Eventually she accompanied her brother William, ten years her senior, to Oxford, where she pursued Anglo-Saxon studies, and was said to have good acquaintances with some other languages. She is said to have been " the first English woman that had ever attempted the Saxon language, a tongue ancient and obsolete." Her biographer adds " in all probability the last." In 1709 she published: *An English-Saxon Homily on the Birthday of St. Gregory: anciently used in the English Saxon Church, giving an account of the conversion of the English from Paganism to Christianity. Translated into modern English with Notes, etc., by Elizabeth Elstob.* After this she was styled " the justly celebrated Saxon Oracle." In the Preface is a very incisively worded claim for the education of women, and she invites the ladies to be acquainted with the language of their predecessors and the original of their mother tongue. In 1715 she published: *The Rudiments of Grammar for the English-Saxon Tongue, first given in English: with an Apology for the study of Northern Antiquities. Being very useful towards the understanding our ancient English Poets and other writers.* In her Preface is a long criticism on the value of the Anglo-Saxon element in modern English. Miss Elstob began a work to be called the *Saxon Homiliarium,* a collection of the English Homilies of Ælfric, Archbishop of Canterbury, but this was left unfinished. After the death of her brother William in 1715, Miss Elstob had a great struggle for a livelihood, and returned to Evesham, " to get her bread by teaching children to read and work." Her books and manuscripts, entrusted to a friend for preservation, were lost. Her weekly fee charged to pupils is said to have been at first only a groat. She was befriended first by Bishop Smalridge, afterward by George Ballard and by Mrs. Chapone (the writer on girls' education), who started a subscription for Miss Elstob, which resulted in the purchase of an annuity of twenty guineas. She was then granted help by Queen Caroline till her death in 1737, and eventually Miss Elstob became governess in the family of a peer. Miss Elstob's brother, William (1673–1715), published at Oxford an edition of Roger Ascham's *Letters,* to which he added the letters of Sturmius, Hieron, Osonius, and others to Ascham, 1703. F. W.

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Dictionary of National Biography; and Miss Elstob's works.

ELWELL, BENJAMIN STODDERT (1810–1894). — College president; graduated at the United States Military Academy in 1832, and was instructor there for four years. He was professor of mathematics at Hampden-Sidney College, Washington (Va.) College, and the College of William and Mary. From 1854 to 1881 he was president of the latter institution. W. S. M.

ELYOT, SIR THOMAS (1499?–1546). — One of the outstanding educational writers of the Renaissance period in England. Elyot was probably born in Wiltshire. His father was a judge, first of assize, then of the common pleas. Sir Thomas Elyot was not apparently a student of either Oxford or Cambridge University, but was associated, nevertheless, with the group that Sir Thomas More gathered round himself at Chelsea. Early he devoted himself to medical studies, and informs us that before the age of twenty he had read over most of the ancient and medieval authorities. Elyot spent an active life politically, being, like Vives (*q.v.*), connected with the negotiations on the divorce question of Queen Catharine of Aragon. He was sheriff of several counties and M.P. for Cambridge in 1542, and died in 1546. Sir Thomas Elyot belongs to the type of educationist common in his day who had formed his educational views to some extent on a wide practical knowledge of the world, but more essentially on the new Renaissance studies. He was the friend of Colet, Lily, and Ascham, and one of the pioneers of the movement for the study of Greek in England. The *Governour* is a treatise on political philosophy, but it branches out into all the domains of social philosophy, including ethics and education. The view of such a book in an age of absolute monarchy, like the Tudor, was of great importance. That it was written in English gave it still more of popular significance. Besides his indebtedness to Plato and Aristotle, more immediate models were Giovanni Pontano, Philip Beroaldo, and Francesco Patrizi. In spite of all the sources which are suggested for the *Governour*, it marked essentially an epoch in the history of our literature, since it is the first book in the vernacular on moral philosophy. In the *Castell of Helth* Elyot was the first to write on "physic" in English, and tells his critics to remember that if he writes in English, the Greeks wrote in Greek and Romans in Latin, *i.e.* each in their mother tongue. Elyot consistently translated into English such works as portions of Isocrates, St. Cyprian, and Plutarch.

The *Governour* attempts to point out the right education and training of the ruler of the State. But the training which is best for statesmen, he evidently wishes to suggest, is best for any other who can contrive to get it. He sees the importance of the choice of a nurse for the earliest years. Then the nobleman himself is the only adequate instructor of the son. Emulation should be encouraged. Latin-speaking should be begun early and constantly used, by speaking it in the home. If a tutor is appointed, it will be his first duty to know the nature of his pupil. Elyot teaches the Platonic view of music in education, and is most insistent on the importance of drawing and sculpture to train the eye and hand, and be of helpfulness to other studies. It is interesting to note, within fifty years of Columbus' great discovery, that Elyot realizes that educational subjects should include geometry, astronomy, and cosmography. He objects to the long-continued, tedious use of grammars in teaching Latin and Greek. Even by 1531 Elyot describes Greek grammars as "almost innumerable." Authors to be read by the child by twelve years of age include Æsop's *Fables*, some Lucian, some Aristophanes, Homer, Vergil, Ovid, Silius, Lucanus, Hesiod, Strabo. Then he should study logic, rhetoric, and cosmography. Then history, moral philosophy. Above all, Plato and Cicero should be studied. Elyot is the first English writer to emphasize the importance of physical education. He illustrates the subject with great stores of examples from ancient history. Horse-riding and shooting, *i.e.* archery, he puts in the first place. The first book of the *Governour* deals with education of the nobles; the remaining two books with the moral qualities to be required in the statesman. The whole book is permeated with the Renaissance spirit, abounding in the appeal to antiquity for historical examples of all points urged.

Besides writing the *Governour*, Elyot rendered the service to the practical side of education of compiling the large Latin-English dictionary published in 1538. This was reëdited by Thomas Cooper, Bishop of Lincoln, about 1550, under the title *Bibliotheca Eliotæ*, and finally was issued as *Thesaurus Linguæ Romanæ et Britannicæ* in 1565. F. W.

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ELZEVIRS. — A famous family of book printers and publishers who flourished throughout the greater part of the seventeenth century. The founder was Louis Elzevir, a bookbinder, who came from Louvain to Leyden in 1580 owing to religious persecutions. He pursued his calling, and later began to sell books, finding a clientèle among the students and instructors of the university. He met with little success, however, until he was appointed university bookseller and publisher to the university. Louis opened up a correspondence with the whole of Europe, and contributed not only to his own success, but to the reputation of the university. His first publication was an edition of *Eutropius* in 1592. In 1595 he adopted the trademark of an eagle grasping seven darts in its claw. The firm began to send representatives to the book fair at Frankfort, to Paris, and all important book centers of Europe. Louis died in 1617, and was succeeded in the business by two of his sons, Matthew and Bonaventure. Many books from their office at this time dealt with the all-important theological questions of the day. The Leyden office entered upon its most flourishing period about 1625 in the hands of Bonaventure and Abraham, a grandson of Louis. In 1625 the office of Erpenius, printer and university instructor, who possessed the only Oriental font in Europe, was purchased by the Elzevirs. In 1629 began the publication in 16mo of Horace and Ovid. In 1641 a series of French drama was issued. By 1652 John and Daniel succeeded their fathers, Bonaventure and Abraham, and published the *Imitation of Christ* and the *Psalms* in that year. In 1655 Daniel moved to Amsterdam. The Leyden office continued successfully until 1681, when it began to decline.

But the better known work was being carried on at Amsterdam, where Louis, a grandson of the founder of the business, opened a bookshop in 1638, and added a printing office in 1640. With the aid of Daniel, who joined Louis in 1655, the house gained great prestige for the important series of publications which it issued, although it is claimed that the Leyden works were typographically better. They popularized literature by introducing convenient editions of the classics in 12mo and 16mo at reasonable prices; they published numerous theological works in Dutch, and brought the works of contemporary foreign writers within reach of the whole of Europe. They had members of the family as agents and representatives in all important literary centers of Europe, and were in touch with the chief scholars and authors of the day. David Heinsius was for long their literary adviser; Salmasius published with them; authors considered it a great honor to be handled by their firm, so that Jean de Balzac sent a letter of thanks to them when they published a pirated copy of some of his works. Many anonymous works which at the time created sensations came from the office of the Elzevirs under a false title page, thus Pascal's *Lettres Provinciales,* and Milton's *Defensio Populi Anglicani.* Few works of importance in classical or contemporary literature failed to find a place in the publications of the Elzevirs, whose reputation among early publishers is only rivaled by Aldus.

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EMBLEMS. — This term is derived from the Greek ἔμβλημα (from the verb ἐμβάλλειν) *i.e.* something thrown in as an ornament. In the usual acceptance of the sixteenth and seventeenth century, an emblem was "a picture and short posie, expressing some particular conceit" (Cotgrave), or, as Francis Quarles puts it, an emblem "is but a silent parable." These definitions are quoted by the late Rev. Henry Green in his classical account of emblem books *Shakespeare and the Emblem Writers* (London, 1870). In this book, the author distinguishes between the following kinds of emblems: Historical Emblems, Heraldic Emblems, Emblems for Mythological Characters; Emblems illustrative of Fables, Emblems in connection with Proverbs; Emblems from Facts in Nature and from the Properties of Animals; Emblems for Poetic Ideas; Moral and Æsthetic Emblems. Emblems are mentioned in Greek writings, and for their origin probably go back to prehistoric times. The part they played in the course of Christian history can be traced in any history of Christian art, for symbol and emblems run through architecture, sculpture, and painting, as well as literature. Mr. Green further points out that we trace them in "pagan tombs and Christian catacombs of ancient Rome," and through the Middle Ages in the illuminated manuscripts. Astrological compilations and the epoch-making *Speculum Humanæ Salvationis* (*c.* 1430), the *Biblia Pauperum,* and other block books, especially books of fables, contain emblematic illustrations. The *Narrenschiff* (*Ship of Fools*) of Sebastian Brandt, 1494, brings in the emblem as an acknowledged type of book. By 1522 Andreas Alciat (*q.v.*) published his *Emblematum Libellus* at Milan. Mr. Henry Green has enumerated 176 editions of Alciat's *Emblems,* and of these 163 were issued between 1522 and 1650. One of the books classed as an emblem book was the *Imagini dei Dei degli Antichi, i.e.* "Images of the Gods of the Ancients," published by Vincenzo Cartari (Chartarius) at Venice in 1556. This served as a dictionary of antiquities, and in its Latin form was used widely in schools, being recommended, for instance, by Charles Hoole, in his *New Discovery,* 1660. Hoole also advises the use of Alciat's *Emblems* as a source for phrases and proverbs required for use in theme writing. The most extensive list of emblem writers recommended for the schoolboy to consult is that given by Thomas Farnaby (*q.v.*) in his *Index Rhetoricus,* 1625. Farnaby names the following: Alciatus, Rhumelius, Sambucus, Fayrus, Joach. Camerarius, Taurellius, Paulus Maccius, Hadrianus Junius, Catsius, *Elegidia Epidictica,* Oræus, Taubillius, Theod. Beza. Sambucus was a Hungarian physician, whose *Emblemata* were published in 1564 at the Plantin Press at Antwerp. Beza's *Emblemata* were issued at Geneva about 1581. Catsius was the greatest of the Dutch emblem writers. Farnaby omits from his list the famous Brandus, Bocchius, and Jovius. The inclusion, however, in his list of Paulus Maccius, the Italian emblem writer, who published his *Emblemata* at Bologna in 1628, has its interest, since it illustrates a possible method of learning Italian by having the picture, Latin verses, and Italian verses side by side.

The most important collection of emblems in English in the sixteenth century was that of Geoffrey Whitney in 1586, entitled *A Choice of Emblems.* This was printed and engraved in the house of Christopher Plantin at Leyden. The collection was made from the works of earlier writers, with particular recourse to the authors whose emblem books had been published by Christopher Plantin, though Whitney's selection was not confined to these. It was beautifully reproduced under the editorship of Henry Green in London in 1856. Whitney dedicates one emblem to the Youth at the School of Audlem in Cheshire. This is entitled *Studiis invigilandum* (" We must be watchful at studies "). The last four lines run: —

> For, what I woulde unto myselfe shoulde chaunce,
> To you I wishe, wheare I my prime did spende.
> Wherefore behoulde this candle, booke and glasse
> To use your time, and knowe how time dothe passe.

Whitney thus connects his emblems with schools and schoolmasters. One set of verses beneath the emblem describes the schoolmaster of Faleria. Books of emblems clearly appealed specially to the studious, and the schoolmasters such as Thomas Farnaby (*q.v.*) and Charles Hoole (*q.v.*) required boys to consult them. In the work for the fifth form, Hoole (*New Discovery*, etc.) points out that for theme writing and verses, boys should have a large commonplace book into which they collect those picture heads, " emblems and symbols " out of Alciat, Beza, Quarles, Reusner, and Chartarius." Reusner's *Symbola Heroica* had been recommended by John Brinsley (*q.v.*) in the *Ludus Literarius* (1612) as a rich storehouse for materials in theme writing. The book dealt with 154 emperors, giving short characterizations, and treated symbolically. The emperors extend over classical and medieval times, thus introducing the schoolboy to more than ancient history; the mottoes attached to each emperor are moral, and often epigrammatic. Thus there is ample scope for phrase culling. Amongst the English emblem writers Andrew Willet (*c.* 1598), published a *Century of Sacred Emblems.* Mr. Green quotes the English form of the sixty-seventh emblem, in Latin, on *Puerorum Educatio:* —

> A scholler must in youth be taught,
> And three things keepe in minde ful sure,
> God's worship that it first be sought,
> And manners then with knowledge pure;
> In church, in scoole, at table must he,
> Deuot, attent and handsome be.

Francis Quarles' *Emblems, Divine and Moral,* " the most popular " of all English emblems, were published in 1635. Hoole not only required boys to hunt through Quarles for phrases in theme-writing; he also suggests in the directions for teaching reading in the *Petty School* (1660) that the child should be encouraged to read " delightful books, of English history, as the *History of Queen Elizabeth,* or poetry, as (George) Herbert's *Poems,* Quarles' *Emblems,*" etc. Emblem books were used as reading books. Thus J. Harris published, in 1806, the tenth edition of a book originally published by F. Newbery, entitled: *Choice Emblems, Natural, Historical, Fabulous, Moral and Divine, for the improvement and pastime of Youth. Displaying the Beauties and Morals of the Ancient Fabulists: the whole calculated to convey the Golden lessons of instruction under a new and more delightful dress for the use of Schools.* F. W.

See Symbolism in Education.

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Green, H. *Shakespeare and the Emblem Writers.* (London, 1890.)

Watson, Foster. *Beginnings of Teaching of Modern Subjects.* (London, 1909.)

EMBROIDERY. — See Household Arts.

EMBRYOLOGY. — The science which deals with the development of the embryo. This science is significant in educational discussions because of the contributions which it has made to the doctrine of culture epochs. The science of embryology shows that every individual passes in its individual development through the stages through which the race has passed in the process of its evolution. This principle has been extended to apply to the post-embryonic development of the individual. H. J.

See Culture Epochs; Zoölogy.

EMERSON, CHARLES WESLEY (1837–1909). — Founder of a college of oratory; educated in the common schools and at Boston University. He was instructor of elocution at Philadelphia, and president of the Emerson College of Oratory at Boston (1880–1902). Author of works on oratory and physical culture. W. S. M.

EMERSON, GEORGE BARRELL (1797–1881). — Educator and author; born at Kennebunk, Me., 1797, and educated in the district schools, Dummer Academy, and Harvard College, graduating in 1817. He was, two years each, principal of a school at Lancaster, Mass., tutor in Harvard College, and headmaster of the English High School in Boston. He was, however, chiefly interested in the education of girls; and for thirty-two years he conducted a secondary school for young women in Boston. For several years he served as a member of the State Board of Education of Massachusetts. He was one of the founders of the American Institute of Instruction, and was a leading contributor to the *Massachusetts Teacher* and other educational journals. He was joint author with Alonzo Potter of the *School and Schoolmaster,* a popular teachers' manual, and he published *Female Education* and *Reminiscences of an old teacher* (1878), which originally appeared in Barnard's *American Journal of Education.* W. S. M.

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BARNARD. *American Journal of Education,* 1858, Vol. V, pp. 417–426.
OLIVER, H. K. George Barrell Emerson. *Education,* November, 1881, Vol. II, pp. 178–182.

EMERSON, JOSEPH (1777-1833).— Advocate of female education; was graduated at Harvard in 1789, where he served as a tutor for several years. He conducted for many years a school for girls at Hartford. Author of *Evangelical Primer* (1812), *Poetical Reader* (1832), and essays on female education. W. S. M.

EMERSON, RALPH WALDO (1803-1882). — The philosopher, poet, and essayist was on his paternal side descended from six generations of Puritan clergymen. His earliest education was received from his father, the Rev. William Emerson, minister of the First Church of Boston. Attempting to put his sons through a forcing process, he records that at the age of three Ralph did not read very well. Further training was gained through Emerson's aunt, who said the Emerson boys were born to be educated, and who, in turn, was described as a spur, or, better, a ferment in their young lives. This remarkable impetus resulted in Emerson, between the ages of eleven and fourteen, reading French, corresponding with his brother in Latin, and writing a variety of verse in the Georgian style. After some years at the grammar and Latin schools of Boston, with the additional knowledge of a little fiction, some history, and much poetry and rhetoric, Emerson entered Harvard College in 1817. There he describes himself as the youth who had no faculty for mathematics and wept over the impossible analytical geometry, and consoled his defeats with Chaucer and Montaigne, with Plutarch and Plato at night. But what the undergraduate neglected in prescribed studies he made up by omnivorous reading and constant writing of poems, essays, meditations, and journals. In the latter Emerson's independent views on education were promptly set down. He does not think it necessary to understand mathematics and Greek thoroughly to be a good, useful, or even a great man, but he does insist that the student, in his arrangements for residence, should have a chamber to himself and sit alone, and should pay so much honor to the visits of truth to his mind as to record them in a journal. After eking out his living by district school teaching, and after winning several college prizes, Emerson graduated in 1821, taught for a year in his brother's finishing school for girls, began a course in divinity, interrupted by a winter in the South in the search for health, and was ordained in 1829 as pastor of the Second Church, Boston. Resigning in 1832 on account of his indifference to certain sacraments, in 1833 he traveled in Europe, meeting among others Landor, Coleridge, Wordsworth, and Carlyle. On his return home and settling in Concord, there appeared between 1836 and 1838 three notable publications, — *Nature, The American Scholar,* and the *Divinity School Address,* which embodied the author's essential views on metaphysics, culture, and theology. In the first appear the fundamentals of his philosophy: self-reliance, or the cultivation of the individual; benevolence, or an optimistic outlook upon mankind ; immanence, or the view which holds nature to be the present expositor of the divine mind. The latter appeared close to a dangerous pantheism, and gave such offense to the more conservative that, when carried out in the *Divinity School Address,* the lecturer was shut out of the gates of Harvard for full thirty years.

It was the principle of self-reliance that offered the clew to Emerson's educational theories. Recalling the cast-iron curriculum of his youth, he now protested that colleges can only highly serve us when they aim not to drill, but to create; when they gather from afar every ray of various genius to their hospitable halls (*Works,* Vol. I, p. 93). Appealing to Pestalozzi for his doctrines of liberality and self-help, Emerson further elaborated his conclusions in his address of 1844 on *New England Reformers.* Here he complains that an education to things is not given. We are students of words; we are shut up in schools, and colleges, and recitation rooms, for ten or fifteen years, and come out at last with a bag of wind, a memory of words, and do not know a thing. We cannot use our hands, or our legs, or our eyes, or our arms (Vol. III, p. 257). These strictures of the Concord philosopher were kindred to those of his cousin, George Barrell Emerson, whose memorial to the American Institute of Instruction led the Massachusetts Legislature to appoint as secretary of the new Board of Education Horace Mann, who specifically acknowledged his indebtedness to the Concord sage. The latter's educational suggestions, however, were not directed merely to object teaching and field work, for he confesses in his *English Traits* that the effect of the drill at Oxford and Cambridge was the radical knowledge of Greek and Latin and of mathematics, and the solidity and taste of English criticism (Vol. V, p. 206). Looking over the Oxford examination papers of the year 1848, he believed they would be too severe tests for the candidates for a bachelor's degree in Yale and Harvard. But while he grants that the English students not only read but write better than the American, nevertheless he fears that their universities, because of their insistence on drill and routine, are hostile to genius, for genius is rare, precarious, eccentric, and darkling (Vol. V, p. 213). For this high aim, as the essay on *Culture* insists, should true education seek. The hardiest skeptic who has seen a horse broken, a pointer trained, or visited the exhibition of the industrious fleas, will not deny the validity of education, — but what an education! Our people prefer the schoolmaster who likes strict rules. They send the child to the Latin class, but they ignore the fact that much of his tuition comes on his way to school, from the shop windows. They seldom realize that individuality is not only not inconsistent with culture, but the very basis of it (Vol. VI, p. 142).

Having been a teacher for four years in city and country schools, a lecturer in local lyceums in all parts of the country, a member of the school committee of Concord, and one of the Board of Overseers of Harvard College, Emerson concluded that scholarship should be created, not by compulsion, but by awakening a pure interest in knowledge. His perfect aim was summed up in a final essay on *Education*, the principles of which are the author's lifelong appeal to individuality and idealism. Seeing, with Leibnitz, how much education may be reformed, he urged that its scope should be as broad as man, and that its object should be a moral one — to teach self-trust. The secret of education lies in respecting the pupil; its two capital facts consist of genius and drill. The one of these is obtained by the will, the male power, which organizes and impresses its own thought and wish on others; the other is fostered by sympathy, the female force, more subtle, lasting, and creative. It is by wit, fancy, and imagination that we can nourish the inspiration in the well-born healthy child.

I. W. R.

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Rand, B. Bibliography of Emerson in Baldwin's *Dictionary of Philosophy and Psychology*, Vol. III, Pt. I. (New York, 1905.)

Suzzallo, H. *Emerson's Education and Other Selections.* (Boston, 1909.)

ÉMILE. — The title of an epoch-making work in the history of education, by Jean Jacques Rousseau (*q.v*). The full title is *Émile ou de l'Éducation.* It inaugurated the period of the New Education, more fully developed by Pestalozzi and Froebel. It was a protest against an education which aimed purely at conventional information, and was a plea, in perhaps exaggerated form, for natural and healthy development of the child. The keynote to the whole work is sounded in the first sentence: "Everything is good as it comes from the hands of the Author of nature; but everything degenerates in the hands of man."

See Rousseau, Jean Jacques.

EMMETROPIA. — See Eye, Hygiene of.

EMORY AND HENRY COLLEGE EMORY, VA. — Founded by the Holston Conference of the Methodist Episcopal Church, South, in 1835, and opened to students in 1838. The original intention of making the institution a manual labor school met with little success, and was soon dropped. The campus contains twenty-three acres, on which are located the dormitories and recitation halls. The entrance requirements are equivalent to about fourteen units. Courses are offered leading to the degrees of Bachelor of Arts and Bachelor of Science. In 1909 there were enrolled in the college 109 students. The teaching staff numbers twelve.

EMORY COLLEGE, OXFORD, GA. — An institution established by the Georgia Conference in 1836. Sub-freshman, college, and postgraduate courses are offered. Admission is by examination, or by certificate from an approved high school. The degrees which are conferred after a regular college course of four years are Bachelor of Arts, Bachelor of Philosophy, and Bachelor of Science. In 1909 there was an enrollment of 294 students. There is a faculty of fifteen members.

EMOTION. — A term used by careful writers to refer to a complex feeling process. Thus anger is an emotion; it is made up of disquieting feelings, which are in part organic, in part of a higher order depending on a sense of injustice, which in turn arises through a comparison of the present situation with standards set up through past experience. One is angry, for example, when he sees a driver beating a horse, partly because any suffering animal arouses certain sympathetic bodily responses, and partly because he has standards of treatment of animals which are outraged by the present scene.

Emotion is to be contrasted with thought or knowledge processes. Thus, when one is angry, he is not a careful observer of all the perceptual details of the situation before him. One cannot sit down and read a book when he is experiencing a violent emotion. For reasons like these, the classifications adopted in all psychologies have distinguished sharply between knowledge and emotion. The distinction between emotion and volition is much less clearly marked. To be sure, a paroxysm of anger may incapacitate one so that he is unable to do anything. This is, however, an extreme case. The more common fact is that one is impelled to action just in the degree to which he is emotionally aroused. The angry man may not go about the attack upon his enemy with clear insight and wisdom, but he is very likely to exhibit great energy and persistence.

The relation between emotion and action has been brought into great prominence in the last two decades by the discussions of Lange and James (James-Lange theory). These two authors drew attention to the fact that a violent bodily reaction in many cases precedes the emotional consciousness, and conditions it. Thus, the melancholic patient has certain characteristic visceral contractions. These are in no wise due to conscious states. They may be due to purely physical causes to be sought in the organism and its state of nutrition. These visceral contractions condition, however, a state of consciousness so powerful and enduring that sooner or later the mental life of the patient will be completely centered about the depressed emotional state. In like terms James points out that the true order of processes is not impression, emotion, action; but in many cases the impression issues immediately in action, and the emotion follows after the action is well under way. Thus one sees danger approaching. He starts to run, or his muscles grow rigid in instantaneous contraction. After the act is well advanced, there arises in experience the emotion of fear. Likewise, in James' terms, we are sorry because we weep; it is not true that we weep because we are sorry.

The theory of the emotions above set forth lays great emphasis upon the external bodily act. This emphasis is extreme. When James says, for example, that there is nothing in an emotion if the muscular activities are inhibited, he fails to do justice to the nervous processes which are the real central causes of both the emotion and the activities. Feeling and emotions depend directly upon nervous conditions. These nervous conditions are undoubtedly motor rather than sensory in type, as may be seen by the analysis of any emotional situation. Thus, the same person may, on two successive occasions, have two totally different emotions in the presence of exactly the same sensory stimuli. When one is reading, a noise disturbs him. When he is ready to go out for a walk, and waiting for the summons of his companion, the same sound may give him great pleasure. The sound cannot explain the displeasure or the pleasure, when it is treated merely as a sensory impression. The sound arouses, in the two cases described, two totally different types of responses. In the reader, the motor processes run counter to the whole set of activities now established. There is confusion in the inner nervous centers. There may be slight muscular response, but the nervous commotion may be great. In the listener, the sound releases a pent-up artillery of motor processes. The exhilaration of released expectation gives satisfaction. Such an analysis as this gives full weight to the motor relations of the emotions, without identifying them with muscular processes.

The foregoing analysis of emotional processes introduces an important line of consideration, which is suggested by James, and more fully carried out by MacDougall (*Social Psychology*). The emotions are very largely conditioned by instinctive organizations. Thus, when an animal is organized to perform a certain type of activity, it derives great satisfaction from that type of activity. A kitten is organized so as to stalk prey and seize it by a sudden leap. This instinctive tract is so fully organized in its nervous system that from earliest days on the kitten derives pleasure from the pursuit of real or imaginary prey. The rolling ball sets the kitten's organized motor processes in operation. The action is instinctive and natural; the emotion follows naturally upon the motor discharge.

Pleasure attaches not merely to instinctive behavior; a well-organized habit is also a natural and agreeable mode of behavior. This comes out most clearly through the negative example. A man who has always been in the habit of going about the routine of his office in a given way will be irritated beyond degree by trivial irregularities. There is nothing so exasperating as to be interrupted in the routine of dressing by the loss of a necessary part of one's apparel. Such examples make it clear that we are continually organizing our emotional tendencies through the habits which we acquire, and the instincts which we allow to develop.

One conspicuous example of cultivated emotional possibilities will be found when one studies any of the arts. Music began in the primitive beating of dull noise-producing objects in rhythmical succession. The rhythm was a natural expression of a fundamental mode of nervous behavior. Because the nervous tissue naturally acts in rhythms, and because the sound in its successive actions upon the nervous tissue coincided with the natural tendency and reënforced it, the primitive musician enjoyed the rhythmical noise. Soon there came to be a selection of sounds that had pitch. The rise and fall of pitch, the accentuation and sympathetic accompaniment of the noise by vocal chord reactions, increased the satisfaction. Now came a growth in the range and modulation of sounds. Then followed combinations of melodies; finally, the growth of harmony. Any genetic study of the arts makes it evident that man grew in emotional appreciation through the cultivation of activities appropriate to the art.

The foregoing analysis introduces the much-discussed problem of education of the emotions. It is often asserted that the school is purely intellectualistic, that the emotional side of the child's nature is neglected, that we do not find in the school the well-rounded nature which should be cultivated in the normal child. Various suggestions have been made as to methods of correcting this supposed defect. Some of these suggestions appear under the doctrine of interest (*q.v.*). Herbart and Spencer both point out that natural mental development always leads to forms of mental activity which are pleasurable. The important corollary to this statement is that anything can be made pleasant through cultivated habit — except the more violent forms of experience which work organic harm. If we can believe the stories told of devotees who perform weird rites of self-destruction, there may be pleasure even in these injurious forms of activity. When, therefore, the question of pleasure in education is seriously discussed, it should be with such broad consideration of the nature of emotion clearly in mind.

Is it ever legitimate to define educational aims in terms of emotions? The foregoing psychological analysis would seem to lead to a negative answer to this question. Emotion is a significant symptom of the way in which an impression arouses an organized being. Emotion may serve to show the individual himself how he is tending in his habits. But emotion can never be discussed intelligently apart from the discussion of habits of reaction. When one is pleased with a piece of news, it shows that the news comports with his plans and tendencies toward action; but the pleasure is never an end in itself. If one would learn to enjoy an art, he must train himself in appreciation and sympathetic modes of response.

If the school will train in right modes of behavior, the emotional symptoms will properly adjust themselves. The teacher should watch the emotions, for they are valuable means of diagnosis. When a child is sulky and displeased, there is an incoördination somewhere. It does not follow that the situation should be modified in the direction of the child's present tastes. The best possible education for the child may be one of retraining his habits, so that he shall have an entirely different attitude. Nor is it true that anything which gives the child pleasure is therefore bad. If the child is normal, and his environment wholesome, there will be a preponderance of pleasurable experiences in his life. The school should find in this principle guidance and motive for organization of that which is natural. The school should never be misled into the fallacy of regarding emotion as a primary end of training. C. H. J.

See Emotional Expression; Feeling; Rewards and Punishments; Volition.

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James, W. *Psychology, Principles of.* Vol. II, Ch. xxv. (New York, 1890.)

Thorndike, E. L. *Teaching, Principles of.* (New York, 1906.)

EMOTIONAL EXPRESSION. — In a volume entitled *Expression of the Emotions in Men and Animals,* Charles Darwin called attention to the necessity of offering some scientific explanation of the complex behaviors which accompany emotions. Darwin regarded these emotional expressions as rudimentary forms of earlier activities which were of importance in the practical life of the animal expressing the emotion. Thus, the frowning of an angry animal is, according to Darwin, the rudimentary form of a facial expression which was natural and useful in combat. The attention which Darwin's book drew to the emotions is undoubtedly responsible for the later discussions, such as those of James in his theory of the emotions (*q.v.*). There are suggestions also in Darwin's work of the relation between emotions and instincts as emphasized in MacDougall's *Social Psychology.* The emotional reactions of human beings have of late been made subjects of elaborate studies in psychological laboratories. The circulation of the blood has been studied with reference to its modifications during emotional states. Other internal activities, such as those of the digestive organs, have also been studied. Cannon was able to show that a cat excited emotionally during the process of digestion is seriously interrupted in the normal process of peristaltic action. A change in the tension of the voluntary muscles also takes place during emotion. This has been repeatedly shown in experiments with the ergograph (*q.v.*) and dynamometer. There is an intimate relation between emotional expression and attention. C. H. J.

See Attention; Emotion.

EMPIE, ADAM P. (1785–1860). — College president; graduated from Union College in 1807, was two years an instructor at the United States Military Academy at West Point, and was president of William and Mary College from 1827 to 1836. W. S. M.

EMPIRICAL METHOD. — In current educational discussion an empirical method is one in which the teaching practices are corrected and improved through mere experience or observation of practice. In this sense it is contrasted with experimental, statistical, and other forms of scientific method. H. S.

See Scientific Method; Experimental Teaching.

EMPIRICAL PSYCHOLOGY. — See Psychology, Empirical.

EMPIRICISM. — A term currently defined as the doctrine that all knowledge is derived from experience and is to be tested in the last analysis by an appeal to observed facts and not by an appeal to theories about these facts or to principles of thought which are supposed to underlie all observation. Locke's *Essay concerning Human Understanding* (1690) is still the classical exposition of this doctrine, and there is, perhaps, no more precise statement of it than is found in his words: "Let us then suppose the mind to be, as we say, white paper, void of all characters, without any ideas; how comes it to be furnished? Whence comes it by that vast store which the busy and boundless fancy of man has painted on it with an almost endless variety ? Whence has it all the materials of reason and knowledge? To this I answer in one word, from experience; in that all our knowledge is founded, and from that it ultimately derives itself. Our observation employed either about external sensible objects, or about the internal operations of our minds, perceived and reflected on by ourselves, is that which supplies our understandings with all the materials of thinking. These two are the fountains of knowledge from whence all the ideas we have or can naturally have do spring" (Bk. II, ch. i, sec. 2). Empiricism, thus conceived, was primarily a protest against the contention that there are innate ideas and intuitive principles which afford a source of knowledge of greater authority than observation itself. In other words, Locke held that thinking is solely an instrument for discovering what relations exist between observed facts and what may be expected from them, and that it is controlled not by principles of its own, but by the character of the material with which it deals. Locke's doctrine found its immediate antithesis in the philosophy of the Cartesians, who maintained that, given definitions and propositions of intuitive certainty, knowledge of scientific validity could be deduced from them without the confirmation of observation; and its later antithesis in the philosophy of Kant and his successors, who maintained that experience involves more than observation, namely, the working over of the material of observation according to principles of combination which that material itself does not yield. The Cartesian view has been known historically as rationalism, and the Kantian as critical empiricism or criticism. Some of Locke's followers, notably Condillac (*q.v.*) (1715–1780), carried his doctrine to the extreme of affirming that experience is a matter of sense impressions exclusively. In this form empiricism is known as sensationalism.

If the doctrine of empiricism is considered in an historical setting wider than that determined by interest in the philosophy of Locke, it will be found to rest on the antithesis, as old as reflective thinking, between theory and practice. The term "empiricism" is derived from the Greek ἐμπειρία, which, in the time of Plato and Aristotle, appears to have become the generally recognized name for bodies of knowledge consisting of a collection of observations, as distinguished from those consisting of a system of coherent principles. Thus Aristotle says: "In view of practice experience is in no respect inferior to science; on the contrary we observe that those who have experience are more successful than those who have theory without experience. The reason is that experience is knowledge of individual cases, while science is knowledge of universals, and practice and genesis have in every case reference to the individual. For the physician does not cure man, except incidentally, but he cures Callias or Socrates or some one of those similarly named, who happens to be a man" (*Metaphysica*, 981*a* 13ff.). The greater serviceableness of empirical knowledge thus recognized by Aristotle has been repeatedly emphasized in the history of thought. The Stoics and Epicureans — notably in the conception of the mind as a *tabula rasa* by the former — tended to construe knowledge wholly as a collection of individual observations, and thus to approach the theory of Locke. In the Middle Ages the perfection given to deductive systems and the consistent arrangement of definitions and propositions produced a reaction in the interest of more empirical methods. The nominalists generally were influential in the reaction, but the greatest contribution of the Middle Ages to the development of empiricism was made by Roger Bacon (*q.v.*). The sixth part of his *Opus Majus*, entitled *De scientia experimentali*, is remarkable for its illustrations of empirical methods. "Because we know nothing adequately without experience," he urged radical reforms for the advancement of science and the betterment of education based upon empirical principles. During the Renaissance, particularly with such men as Leonardo da Vinci (1452–1519), Vives (1492–1546), Campanella (1568–1639), and Galileo (1564–1642), the claims of empiricism grew. In these men interest in the methodology of empiricism is discoverable. It was not, however, until the publication, in 1620, by Francis Bacon, of his *Novum Organon*, that this methodology received anything approaching a comprehensive formulation. Affirming that the understanding left to itself (*intellectus sibi permissus*) can accomplish nothing, he insisted that knowledge advances profitably only when checked and controlled by systematic experimentation and the collection of observations according to rules. To these rules he gave the first generally recognized formulation. Considerable advance in this direction was made by Sir John Herschel by the publication in 1830 of his work *On the Study of Natural Science*, which was one of the chief sources of the *System of Logic* published by John Stuart Mill (*q.v.*) in 1843. Mill's remarkable book undertook to set forth a complete logic and methodology of empirical research, and, although modified in details by subsequent writers, has not yet, as a whole, been superseded.

Locke's doctrine, which received some extension in the writings of Berkeley (*q.v.*) (1685–1753) and Hume (*q.v.*) (1711–1776) and the British associationists, is perhaps the most characteristic product of British philosophy. On the Continent, the Kantian influence has led not only to the idealistic systems of thought with which its development is usually associated, but also to new forms of empiricism, usually known as "pure empiricism." Of this the *Kritik der reinen Erfahrung* (1849) of Avenarius, the *Analyse der Empfindungen* (1885) of Mach, and the *Einleitung in die Philosophie* (1905) of Cornelius are typical. In these writers the attempt is made to free the concept of experience from the psychological entanglements in which it is involved when experience is construed as the method by which the mind is supplied with the materials of knowledge. By " pure experience " they mean the irreducible data or material out of which such distinctions as those of the individual and his environment, the physical and the psychical, thought and things, are generated. Recent important contributions to empiricism have been made by James in his articles entitled A World of Pure Experience (*The Journal of Philosophy, Psychology, and Scientific Methods* for 1904) and his *Pragmatism* (1907) ; and by Dewey in his *Studies in Logical Theory* (1903) and *Influence of Darwin on Philosophy and other Essays* (1910). What is, perhaps, most characteristic of these writers is the recognition, particularly in Dewey's "radical empiricism," of various sorts of experience, such as æsthetic, cognitive, and moral. With Dewey, experience is not the method by which knowledge is acquired, but knowing is a method which experience develops for the organization and control of the situations wherein it becomes uncertain or problematic.

Educational theory and practice have been affected in two principal directions by the doctrine of empiricism. The first of these is illustrated in the program for the reformation of the sciences and the advancement of learning set forth by the two Bacons. While insisting that education should strengthen individual character, they believed that its main ideal is the progress of civilization, the betterment of the economic and physical conditions of life, the progressive conquest of nature by observation and experiment. This spirit in education is peculiarly typical of empiricism. It has always encouraged enlargement of the scope of the curriculum, fostered the development of natural science and industrial education, and promoted the extension of observational and laboratory methods. The second direction in which empiricism has affected education is illustrated in the influence psychology has had on educational practice. The doctrine of empiricism gave to modern psychology its great impetus, for the working out of its theory of knowledge involved no less a task than writing the natural history of the mind. From the consequent advances in psychology have largely come the consideration of genetic methods in education and the efforts to accommodate instruction and studies to the individual's interest and to the stages of his mental growth.

F. J. E. W.

See Induction; Logic; Pragmatism; Bacon, Francis ; Locke ; Descartes ; etc.

References :—

See the various works mentioned in the text of the article.

EMPLOYMENT OF CHILDREN. — See Attendance, Compulsory; Child Labor.

EMPORIA, COLLEGE OF, EMPORIA, KAN. — A coeducational institution founded in 1882 by the Presbyterian Synod of Kansas, with the assistance of a contribution from the citizens of Emporia. The college campus now contains thirty-eight acres of ground. Academic, music, and collegiate departments are maintained. The requirements for admission are equivalent approximately to fifteen units; certificates of accredited schools are accepted. In the college instruction is given in the English Bible as a required part of the course of study for which credit is given. Degrees are granted at the end of four years' study in one of the following groups: classical, English, modern language, scientific, premedical, and pre-engineering. There is a faculty of twenty-one members.

EMULATION. — The instinct or desire to equal or excel others is a motive much used by teachers. The forms of its utilization vary from the most intense personal rivalries and competitions for grades and prizes to the milder ambitions for excellence as determined by impersonal standards, marks, and promotions. Sometimes the emulative impulses of children are stirred by the granting of additional school privileges and immunities, such as days of vacation, exemptions from examinations, etc. The tendency of modern practice is away from the uses of emulation which are characterized by sharp personal competition and end in unsocial attitudes of pupils toward each other, and in the direction of the measurement of qualities and attainments in terms of one's own previous achievement or in terms of conventionalized standards of efficiency.

H. S.

See Rewards and Punishments.

ENCYCLOPEDIA. — The term "encyclopedia" is from the late Latin, occurring (it is said as a false reading) in manuscripts of Pliny, Quintilian, and Galen, in which it was used as a transliteration of *ἐγκυκλοπαιδεία*, a Greek word erroneously formed from the Greek *ἐγκύκλιος παιδεία*, meaning encyclical, or universal, education; that is, the liberal curriculum, or the circle of arts and sciences considered by the ancient Greeks as essential to a liberal education. (See Liberal Arts, Seven.) Hence "encyclopedia" came to be applied to works treating of all the various departments of knowledge, or to works treating of some particular subject in all its aspects or branches. It is, in general, in this sense that the term " encyclopedia " is now applied to many works extending through the Middle Ages down to about the middle of the seventeenth century, and to various occasional works of a later date. They are in general both in subject matter and arrangement treatises or groups of treatises intended and adapted more for continuous reading or for study than for casual reference. They are also characterized, to a greater or less extent, by having been written by one man or two men, who treated not only the subjects in which they were specialists, but also others of which their knowledge was derived from miscellaneous sources, and not infrequently from hearsay.

Varro (B.C. 116–27) wrote a treatise on the *Libri Novem Disciplinarum*, which dealt with the subjects of the liberal education, medicine and architecture being added to the series, which later became traditional. The earliest extant work of the encyclopedic character is the Natural History of Pliny the Elder (A.D. 23–79), which in the nature of its material bears more resemblance to our modern encyclopedias than many later works. It is a work of thirty-seven books, containing a mass of undigested information on cosmography, astronomy, geography, geology, zoölogy, anthropology, medicine, metallurgy, mineralogy, and the fine arts, as these subjects were then known. This information was gathered by Pliny in the leisure hours of his public employment; and his work was universally known and of high authority throughout the Middle Ages. Pliny's work was followed, in the earlier centuries of the Middle Ages, by various minor ones, including the *De Nuptiis Philologiæ et Mercurii*, forming the first two books of the work sometimes called the *Satyra* or *Satyricon*. This was written, about 470 A.D., by Martianus Minæus Felix Capella (*q.v.*), an African scholar, self-styled "the foster-child of the city of Elissa." It is largely in verse, and professedly gives an account of the marriage of Mercury to Philology, personified as a learned maiden. The seven liberal arts, personified, give an exposition of their branches of learning, and the work was widely used as a textbook in the Middle Ages. A work of more erudition was the *Etymologiarum Libri XX*, or *Origines*, written early in the seventh century by Isidore (560?–636) (*q.v.*), Bishop of Seville, which included a treatment of theology, angelology, and Hebrew antiquities. This work is the basis of the *De Universo*, or *De Natura Rerum*, of Rabanus Maurus (*q.v.*) (776–856), Archbishop of Mainz. About the tenth century there appeared a work compiled by one Suidas, of whom nothing further is known; it was primarily a lexicon, but contained also much encyclopedic matter, including historical and theological material, besides biographical and geographical information, so that in character it is suggestive of the modern encyclopedic dictionary. The encyclopedic part of it is the source of much of our important knowledge of the writers and languages of antiquity.

The greatest encyclopedia of the Middle Ages is the *Bibliotheca Mundi*, or *Speculum Majus*, compiled by Vincent de Beauvais (*q. v.*) (*d.* about 1260), a Dominican friar. This is a work of real scholarship, and constitutes a vast storehouse of the knowledge of that age. In the printed editions it is divided into four parts; — *Speculum Naturale*, treating of natural history ; *Speculum Doctrinale*, giving an epitome of scholastic learning; *Speculum Morale* (considered to have been added by some other person), treating of ethics or moral philosophy ; and *Speculum Historiale*, giving the history of the world down to 1244.

Other encyclopedias of this early time were *Li Livres dou Tresor*, written in French, by Brunetto Latini (*c.* 1230–1294), a Florentine poet and grammarian, in exile in France; the *De Proprietatibus Rerum*, by Bartholomæus de Glanvilla (*fl. c.* 1370), an English Franciscan; and other works of minor importance, or restricted subject matter, such as that of Petrus Berchorius, or Pierre Bercheure (*d.* 1362), a French Benedictine ; that of George Reisch (*q.v.*), a German prior of the latter half of the fifteenth century; that of Raphael Maffei (1451–1522) of Volaterra, which gives greater importance to geography and biography than any of its predecessors; and that of Paulus Scalichius de Lika, a Hungarian count, entitled *Encyclopædia seu Orbis Disciplinarum*, etc., which was the first work to include the term "encyclopedia" as a part of its title. In 1501 George Valla published in Venice, his *De Expetendis et Fugiendis Rebus*.

In 1630 appeared the *Encyclopædia Septem Tomis Distincta* of Johann Heinrich Alsted (*q.v.*) (1588–1638), which is the first work to use the term "encyclopedia" in its modern sense, as in itself implying an encyclopedic treatment; and which, also, immediately precedes the transition to the modern system of placing the subject matter under titles alphabetically arranged. The controlling aim in the arrangement of these early works was to present a systematic view of the different branches of knowledge treated, showing their interrelations; and various works of the same general type have appeared in modern times, mainly in Germany in the eighteenth and nineteenth centuries, treating, for the most part, of some particular philosophical system. Among such works are Eschenburg's *Lehrbuch der Wissenschaftskunde* (1792), Schmidt's *Allgemeine Encyclopädie und Methodologie der Wissen chaften* (1810), and Hegel's *Enclycopädie der philosophischen Wissenschaften* (1817).

The change to the alphabetical arrangement marked a corresponding change in the uses to which the encyclopedia was put; it was becoming the book of general reference rather than a work mainly for scholars or students. This purpose of general reference had previously been served by elaborate and laborious indices; but the modern combination of a dictionary arrangement with encyclopedic subject matter is simpler and less laborious. It involves, however, when fully carried out, as in the typical encyclopedia of to-day, an abandonment of the broad and inclusive treatment of a whole science or a branch of science for the explanation or description of subject matter which is indicated by titles designative merely of phenomena, isolated facts, persons, places, theories, etc. It has also involved a radical change in the manner in which encyclopedias are made. The best modern encyclopedias are not merely careful compilations, but largely works of original composition and authority, written by a large number of men who write as specialists having original and authentic knowledge of the subjects which they discuss. The dictionary arrangement has also led to many encyclopedias being entitled dictionaries or lexicons. There has also been a radical change in the nature of the illustrations; whole-page plates in which were grouped illustrations of things treated at different places have given place to scattered illustrations, each accompanying the text to which it relates. The pictures of objects in nature are now truer to their original, because of the change in the character of the drawings themselves, and from the fact that the early illustrations were largely made from memory, not to say, at times, from hearsay with a large license to the imagination, where the modern pictures are chiefly from photographs.

The earliest important alphabetically arranged encyclopedia was *Le grand dictionnaire historique, ou le mélange curieux de l'histoire sacrée et profane* by Louis Morréi (1643–1680), published at Lyons in 1674. This was a notable work, and the best of its kind at the time of its publication. It passed through many editions in which it was variously revised, and was translated into most of the languages of Europe. An important and valuable work by Pierre Bayle (1647–1706), entitled *Dictionnaire historique et critique*, published in 1695–1697, was originally intended to correct the errors and supply the omissions of this and other works, but developed into an independent work. This work passed through many revisions, and was translated into English and German. The French Academy published in 1694 an encyclopedic dictionary named *Le dictionnaire des arts et des sciences*, compiled by Thomas Corneille (1625–1709), which was followed by various other similar works by other authors. Among the Italians Marco Vincenzo Coronelli (1650–1718), a Franciscan friar and geographer, planned a work which was to include articles on all subjects arranged in a strictly alphabetical order. Only seven volumes were published, and these were so inaccurate as to render them of little value.

In Germany, Johann Hübner (1668–1731), a geographer of Hamburg, was the author of the prefaces to two encyclopedic dictionaries which were published at Leipzig under his name, but were the work of various authors, the first dictionary being published in 1704 and the second in 1712. These works were often reprinted during the eighteenth century. In 1721 there was published in Leipzig, by Johann Theodor Jablonski (*c.* 1654–1731), an encyclopedia including the subjects of theology, history, geography, biology and genealogy, and entitled *Allgemeines Lexicon der Künste und Wissenschaften*, which has been reprinted in various revised editions. One of the most notable of all the encyclopedias or dictionaries of the eighteenth century was that written largely by Johann Heinrich Zedler (1706–1760), a German bookseller at Leipzig. It was entitled *Grosses Vollständiges Universal-Lexicon*, etc., and was published in sixty-four volumes. It was the most comprehensive and exhaustive work of its kind, and was remarkable for including, contrary to the custom of that day, biographies of persons still living.

In England the first alphabetical encyclopedia was that written by John Harris (*c.* 1667–1719), a London clergyman. It was entitled *Lexicon Technicum, or an universal English Dictionary of Arts and Sciences*, and was published in 1704, at London. In 1728 appeared the first of the great English encyclopedias of to-day. It was published by Ephraim Chambers, and was entitled *Chambers' Encyclopædia, or a Universal Dictionary of Arts and Sciences*, etc. One of the subsequent editions of this work was the basis of the excellent encyclopedia published by Abraham Rees in 1778–1788.

In 1751 there appeared, in Paris, the first volume of the *Encyclopédie ou Dictionnaire raisonné*, etc., which has come to be called *par éminence* the *Encyclopédie.* This great work was originally planned as a translation of *Chambers' Encyclopædia*, but was developed by Diderot (1713–1784), who was the first to undertake the work, into what proved to be the organ of the enlightened thinkers of the period, and exerted an almost revolutionary influence upon the culture of Europe. With Diderot was associated as editor D'Alembert (*q.v.*), until his desertion in 1759 ; besides his editorial work, he wrote the preface to the work. Among the contributors were included many of those who laid the basis for the social and political revolution of the next generation, including Voltaire, Rousseau, Daubenton, Mallet, Grimm, Quesnay, Turgot, Marmontel, Holbach, Duclos, and Jancourt. The attitude of the work was socially, politically, and religiously unorthodox, and it provoked violent opposition from the clergy and the conservatives of the old régime, and persecution for Diderot. (See ENCYCLOPEDISTS.)

In contrast to this encyclopedia, which was also largely a dictionary proper, was the *En-*

cyclopædia Britannica, the first edition of which was completed in 1771, being published, at Edinburgh, in numbers or parts. The plan of the work was to treat the arts and sciences as a series of distinct treatises, with numerous references or briefer articles arranged with them in alphabetical order. Who was the originator of the plan is uncertain, some evidence pointing to a printer William Smellie (1740 to 1795), other to one Colin Macfarquhar. The ninth edition of this work (published from 1875 to 1888) includes a series of essays or treatises upon the arts and sciences and of extended articles in history, biography, and theology that are most remarkable for accuracy and scholarship. This edition is suited chiefly for the use of the scholar or specialist; but the subjects treated were made available for reference by an elaborate index published with a supplement in 1902. The eleventh edition, published in 1911 by Cambridge University, England, has been modified in various ways calculated to render the work suitable to meet the needs of a wider public.

The earliest work to present the form of the typical modern encyclopedia, suited for use by the general public as a book of reference, was the German work, *Brockhaus's Konversations-Lexicon*, the first edition of which was published 1796–1808. This work, planned and published by Friedrich Arnold Brockhaus (1772–1823), a German publisher, embodied the idea of using many small articles instead of protracted essays, and gives information upon contemporary matters of biography, politics, etc. A mixture of the encyclopedic and dictionary forms is presented by various modern dictionaries, typically in the *Century Dictionary*, which, besides being a dictionary of English in the ordinary sense, is largely encyclopedic in its titles and subject matter, but excludes biography and geography from its main vocabulary. The French *Dictionnaire universel encyclopédique* of Pierre Larousse combines a brief, but complete, encyclopedia with a general dictionary, as does also, in a briefer scope, the Spanish *Diccionario Enciclopédico de la Lengua Castellana* of Elias Zerolo.

All the preceding works, except as noted, are more or less general in their scope ; but from the last part of the nineteenth century there has been a notable growth of special encyclopedias upon a multitude of subjects, some of them of great merit for their learning and a few for their literary qualities.

Among the more important of the special encyclopedias now published are: *Cyclopædia of American Biography*, 6 vols., 1886–1889. *Dictionary of National Biography*, 1st ed., 63 vols., 1885–1900, suppl. 1901 ; 2d ed., 22 vols., 1908. This is a work of the highest authority, and contains may extended articles of high literary and critical merit. The original editor was Sir Leslie Stephen, who retired on account of ill health, and was succeeded by Sidney Lee. Besides the work contributed by these two, there were articles by 653 other contributors, the whole work covering upwards of 29,000 biographies of British people, not living. *Cyclopedia of American Horticulture*, L. H. Bailey, ed., 4 vols., 1900–1902. *Encyclopædia of Agriculture* (British), 4 vols., 1907–1909. *Encyclopædia of Accounting*, 8 vols., 1903–1909. *Dictionary of Architecture and Building*, Russell Sturgis, ed., 3 vols., 1901, a work of extended description with biographies, and many artistic illustrations. *Grove's Dictionary of Music*, 2d ed., edited by J. A. Fuller Maitland (original editor Sir George Grove), 5 vols., 1904–1910; a very full and scholarly work containing historical and technical matter as well as many biographies. *Jewish Encyclopedia*, 12 vols., 1901–1905, covering Jewish history, religion, literature, and customs. *Encyclopædia Biblica*, 4 vols., 1899–1903, historical and archæological in its content, edited and largely written by T. K. Cheyne. *Dictionary of the Bible*, 4 vols., 1898–1902, supplementary volume 1904, historical, archæological, and exegetical, edited by James Hastings. *New Schaff-Herzog Encyclopædia of Religious Knowledge*, 12 vols., 1908–, edited by Samuel Macaulay Jackson. This work is very inclusive in its scope, and is especially full and accurate in its biographies of medieval and early English divines. In 1908 began the issue under the editorship of J. Hastings of the *Encyclopædia of Religion and Ethics* which is to be completed in ten volumes. The *Catholic Encyclopædia* (1909–) to be completed in fifteen volumes is devoted to "the constitution, doctrine, discipline, and history of the Catholic Church."

Among the more important encyclopædias now published in the languages of modern Europe are:

In English : *Chamber's Encyclopædia* (1888–1892), a British work ; *Appleton's Universal Encyclopædia* (1898) ; *Nelson's Encyclopædia* (1905–1907), smaller than the other works in this list ; *Encyclopædia Americana* (1907), notable for its fullness in articles dealing with technical subjects, as mathematics, engineering, and the trades. *The New International Encyclopædia* (1907), which aims to treat all subjects equally with a view to meeting the needs of the average consulter. *Encyclopedia Britannica* (1911).

In foreign languages. — French: *Larousse. Grand dictionnaire universel du XIXième siècle français*, 1866–1890 ; *Nouveau Larousse, illustré. Dictionnaire universel encyclopédique*, 1898–1904, suppl. 1906. German : *Brockhaus' Konversations-Lexikon ; allgemeine Deutsche Real-Encyclopädie*, 14th ed., 1892–1895 ; *Meyers grosses Konversations-Lexicon*, 6th ed., 1905–1909. Norwegian: *Salmonsen's store illustrerede konversationslexikon*, 1893–1907. Swedish: *Nordish familjebok; konversationslexikon och realencyklopedi*, 1876–1899. Italian: *Nuova enciclopedia italiana, Dizionario generale di scienze, lettere, industrie, ecc.*, 6th ed., 1875–1888 ; suppl.

1889–1899. Spanish-American: *Diccionario enciclopédico hispano-americano de literatura, ciencias y artes,* 1887–1899. Russian : *Bol'shaia entsiklopediia,* 1902. Hungarian: *A Pallas nagy lexikona,* 1893.

ENCYCLOPEDIAS OF EDUCATION. — The arrangement and discussion of topics dealing with or bearing on educational theory and practice, either in systematic form or in alphabetical order. The number of encyclopedias which deal specifically with education is small, and is represented chiefly in the German language. Of historical interest is the *Encyklopädische Pädagogisches Lexicon* of I. G. C. Wörle (1835). The earliest work under the modern conception of encyclopedia is that of K. G. Hergang, *Pädagogisches Real-Encyklopädie* (Grimma and Leipzig, 1851, 2d ed.). The first large contribution of more than transitory value was the *Encyklopädie der gesammten Erziehungs-und Unterrichtswesen* (Gotha), edited by K. A. Schmid, the first edition appearing in eleven volumes from 1858 to 1870, and the second in ten volumes from 1876 to 1887. This is a comprehensive work, somewhat too diffuse, dealing with all aspects of education with valuable contributions to the history of education. There is an abridged edition of this work in two volumes under the title *Pädagogisches Handbuch für Schule und Haus* (Leipzig, 1883). In 1865 there was issued *Dictionnaire d' Éducation Publique et Privée,* by D. Raymond as a volume of the *Nouvelle Encyclopédie Théologique,* a Catholic work (Paris, 1865). The first work in English was the *Cyclopædia of Education* edited by H. Kiddle, and A. J. Schem, 1877, followed in 1881 by an abridgement, *Dictionary of Education,* and supplemented annually by the *Yearbook of Education.* The scope of the work is narrow, and deals mainly with American, and, in part, with English educational questions. The statistical portion of the work was for the time the most valuable. The important French encyclopedia of F. Buisson, *Dictionnaire de Pédagogie et d'Instruction Primaire,* appeared in 1882–1888 (Paris), and is now being produced in a second edition. It is in two parts, the first dealing with the history, theory, and organization of education ; the second with the subject matter of the primary school and general topics of importance to the teacher. A small work of very limited scope is F. Sander, *Lexicon der Pädagogik* (Leipzig, 1883). A good work in one volume, but without any claim to completeness, is the *Encyklopädisches Handbuch der Erziehungskunde mit besonderer Berücksichtigung des Volksschulwesens* (Wien and Leipzig, 1884) by G. A. Lindner. This work formed the groundwork for the more recent and fuller *Enzyklopädisches Handbuch der Erziehungskunde,* edited by Dr. Joseph Loos (Vienna und Leipzig, 1906), a work in two volumes, giving especial attention to Austrian education and furnishing good bibliographies. A second *Cyclopædia of Education* in English was the work edited by A. E. Fletcher and published by Sonnenschein (London, 1892); within the limits of its 562 pages it contains a good deal of useful information. The largest of recent German encyclopedias is the *Encyklopädisches Handbuch der Pädagogik,* edited by W. Rein, a work wholly under Herbartian influences. The first edition appeared in seven volumes from 1895 to 1899; the second, in ten volumes, from 1903 to 1910, is printed in Roman characters. The work, as is to be expected, pays especial attention to German educational problems. It is perhaps not so helpful as might be desired on the biographical and historical sides. Of a more specialized character than any of the works so far mentioned are the *Enzyklopädisches Handbuch der Schulhygiene,* by R. Wehmer (Leipzig, 1904), and the *Enzyklopädisches Handbuch des Turnwesens* by K. Euler (Vienna, 1896).

Different in arrangement are the systematic encyclopedias of education which have appeared in Germany. These works are not arranged in alphabetical order, but are divided and subdivided into main and subsidiary topics. The best and earliest examples of this type of encyclopedia is the *Encyklopädie, Methodologie und Literatur der Pädagogik* (Leipzig, 1861 and 1878), by K. V. Stoy, a work which elaborates the Herbartian principles. The first book deals with the philosophy of education, principles of educational hygiene, theory of education and training, history of education, practice of education, the second book treats of the methodology and literature of education, with directions to teachers for the study of education. To this class belongs the work of A. Vogel, *Systematische Encyklopädie der Pädagogik* (Bernburg, 1881), with numerous references to educational literature within the limits of the topics treated. Rein's *Pädagogik in systematischer Darstellung* (Langensalza, 1906) is a work of the same type as Stoy's, but lacks a good index to complete its thoroughness.

Although falling neither under the class of systematic or alphabetic encyclopedias, Barnard's *American Journal of Education* (1855–1881) must be included here, for, as G. Stanley Hall says, this work is " probably the most valuable periodical ever published in any language, now constituting a vast cyclopedia of information on many, if not on most, topics connected with education " (*Bibliography of Education,* p. 2). A useful index to this work has been published.

Herzog's *Real-encyklopädie für protestantische Theologie und Kirche* (3d ed., Leipzig, 1896–1909) contains valuable educational material of a general as well as religious character. In using this work the index, Vol. 22 (Register) should be consulted under such titles as *Erziehung, Pädagogik; Katechismen und Katechis-*

musunterricht; Schule und Kirche; Kirchenordnungen; Schulwesen, etc.

See Bibliographies of Education.

ENCYCLOPEDISM. — The term more specifically applied to that comprehensive conception of education which developed particularly during the seventeenth century, and which emphasized the importance of the universal comprehensiveness of the subject matter of education as opposed to the restrictive humanistic views of the Renaissance education as well as the restrictive views of the scholastic devotees of the traditional seven liberal arts. How the encyclopedic conception of learning was kept alive during the Middle Ages has been indicated in the article on Encyclopedia. (See also Liberal Arts, Seven.)

Encyclopedism was then kept well before the world by the medieval educationists in the textbooks produced. Francis Bacon (1561–1626) gave the idea further impetus by prescribing not only an encyclopedic curriculum, but also a method which should inquire into discoverable as well as discovered knowledge, and supply a method of instruction as well as a method of inquiring into scientific knowledge. As Bacon said in writing to Casaubon (*q.v.*), his great desire was "to draw the sciences out of their hiding places into the light." Bacon endeavored in the *Advancement of Learning* and other books to divide the subject matter of the sciences and to give a review of results hitherto obtained. In his *Novum Organum*, he described his method for obtaining new knowledge and filling up the gaps of the old. The greatest encyclopedic schoolmaster of the seventeenth century was, of course, J. A. Comenius (*q.v.*). The title of his *Didactica Magna* shows his encyclopedic purpose (in English translation) : *The Great Didactic setting forth the whole art of teaching all things to all men, or a certain Inducement to found such schools in all the Parishes, Towns and Villages of any Christian Kingdom, that the entire Youth of both Sexes, none being excepted, shall quickly, pleasantly and thoroughly become learned in the sciences*, etc. The educational ideal of Bacon was represented in the theory of Ratke (1571–1635), and found more scientific expression in John Valentin Andreæ's (*q.v.*) *Reipublicæ Christianopoliticæ Descriptio.* For Andreæ required mathematics and natural science to be added to the humanist education. Still more conspicuous were the encyclopedic tendencies of Bacon's teaching reproduced in the *Encyclopædia Scientiarum Omnium* (1630) of Johann Heinrich Alsted (*q.v*). This work was the immediate predecessor of Comenius' *Didactica Magna* (1632). Alsted (1588–1638) has been overshadowed by Bacon's reputation, but he was highly spoken of by the great Vossius. Bayle (*Hist. and Crit. Dict.*, Vol. I, p. 234) says Alsted's chief employment was to compose methods and reduce the several branches of arts and sciences into certain systems. Comenius used the term *Pansophia* for the completed round of ascertained knowledge in the sciences. This would consist in the concise and authoritative statement of all that is known in each science. The summary of Pansophia, therefore, was attempted in the school textbooks, such as his *Janua Linguæ Latinæ reserata* (1631). John Milton, in his *Tractate of Education* (1644) may rather be considered as a successor of the early Renaissance tradition of educational encyclopedism as found in J. L. Vives' *De Tradendis Disciplinis* than as a successor to the ideas of Bacon (see *Nineteenth Century*, October, 1909, article on a Suggested Source of Milton's *Tractate*). Milton's curriculum included Latin, Greek, Hebrew, Chaldee, Syriac, Biblical history, divinity, church history, politics, law, agriculture, natural philosophy, astronomy, geography, natural history, mathematics, history, engineering, navigation, architecture, medicine, and what we now call biology.

In connection with encyclopedic education the suggestion by the friends of Comenius in England, viz. Samuel Hartlib (*q.v.*) and John Dury (*q.v.*), should be mentioned. These active educationists proposed an *Office of Address*, anticipating the establishment of an office similar to the Bureau of Education in the United States, but more extensive in its aims, which included the cataloguing of all objects of learning, the entering of all new discoveries in learning and knowledge, exchange of hospitality among scholars, correspondence and interchange of introductions to the learned among various countries, a special printing press for the issuing of publications to schools, universities, and learned people. The agents of the *Office* were to act as inspectors "to oversee all schools," and to communicate with all schoolmasters to keep them up to date. To further these encyclopedic objects Hartlib wrote the *Discovery of Public Address* (1648) and his *Further Discovery* (1649), and Dury wrote his *Seasonable Discourse* (1649).

Another source of encyclopedism in education was the necessity of a wider training for the noblemen and gentlemen than was to be found in the ordinary schools and universities. From the courts of Italy in the Renaissance times came the tradition of accomplishments in the arts of living as opposed to *learning*, or at least supplementary to those of learning. In France Louis XIII had established an academy near Juilly in 1638, with a curriculum including physical science, mathematics, geography, heraldry, French history, Italian, Spanish. As early as 1599, a German academy had been established at Cassel, the *Collegium Mauritianum*, and in the following century, Germany established on that model a number of Ritterakademien. A number of efforts were made to introduce the academy mainly on the French model into England, but without success. Amongst the attempts were those of Sir Humphrey Gilbert (1572) (*q.v.*) ; Edmund Boulton (1617) (*q.v.*) ; Sir Francis Kinaston (1635) (*q.v.*) ; Sir Balthasar Gerbier (1648) (*q.v.*), Lewis Maidwell (1700) (*q.v.*). Apart from these projects, there was a number of various institutions in London, which collectively were capable of affording encyclopedic education. In 1625 Sir George Buck, in his *Third University of England*, compiled a catalogue or table of all the arts and sciences used and taught " in this University " of London.

As an educational ideal in England, encyclopedism substantially comes to an end with John Locke (1632–1704). In his essay *Of Study* (a posthumous publication) appears the *locus classicus* which gives up encyclopedism. " The extent of knowledge or things knowable is so vast, our duration here so short, and the entrance by which the knowledge of things gets into our understanding so narrow . . . that the whole time of our life . . . is not enough to acquaint us with all those, I will not say which we are capable of knowing, but which it would not only be convenient but also very advantageous to know . . . " With the renunciation of encyclopedism, comes the new anti-encyclopedic conception of education, the *Conduct of the Understanding*. The study of the sciences is to be regarded, Locke there says, " as an increase of the powers and activity of the mind, not as an enlargement of its possessions." The so-called *Enlightenment* (*q.v.*), represented in France by Bayle, Voltaire, D'Alembert, Diderot, Rousseau, and in Germany by Leibnitz and Wolff, was a philosophical school, based on lines of empirical encyclopedism, rather than on metaphysical speculation. Corresponding to each phase of philosophical encyclopedism were various educational theories, until in Madame de Genlis (1746–1830) appeared as advocate for encyclopedic education for both men and women.

F. W.

See ACADEMIES ; BACON, FRANCIS ; COMENIUS; ENCYCLOPEDIA; LIBERAL ARTS, SEVEN; MEDIEVAL EDUCATION; VIVES.

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ENCYCLOPEDISTS. — The name given to the group of scholars, philosophers, theologians, and others who contributed to the *Encyclopédie ou Dictionnaire Raisonné des Sciences, des Arts et des Métiers* (*Encyclopedia or Classified Dictionary of Sciences, Arts and Trades*). This great work was conceived and planned by Diderot (*q.v.*), inspired by the plan of a universal dictionary sketched by Bacon no less than by the success of Chambers' *Cyclopedia or Universal Dictionary of the Arts and Sciences* (London, 1727). The work was produced under the editorship of Diderot, and, for the early part, D'Alembert (*q.v.*) from 1751 to 1772, amidst the greatest difficulties due to the opposition of reactionary ecclesiastics and government officials. It was produced in twenty-eight volumes, supplemented in 1776–1777 by five more. There was thus provided a rallying point for the representatives of the new school of thought in all branches of intellectual activity, which in its result helped definitely to formulate the prevailing opinions. The most noteworthy of the contributors who threw themselves heart and soul into the work were Montesquieu, Turgot, Rousseau, Buffon, Haller, Condorcet, Quesnay, Grimm, and Voltaire. Fearless criticisms were offered of civil and ecclesiastical authority, at any rate in the volume with which the publisher did not tamper. And the main purpose of the project as it stood out in the minds of the leaders was to spread the light and renew the hope of a better society. " It united the members of rival destructive schools in a great destructive task" (Morley).

The educational opinions which are scattered throughout the work are of interest. They summarize the views of the sense realists, just as on the philosophic side the influence of Locke is seen. Education is defined as the " care taken to nourish, raise and instruct children ; its objects are (1) health and good physical development ; (2) uprightness and training of the spirit; (3) character, that is, conduct of life and the social qualities." Education is for society, the family, and the State. Each grade of society should be given an education appropriate to it. The aim of education is to secure happiness through the best use of our capacities. Although D'Alembert holds up the public system of Geneva as an example, more attention is given to the education of the children of the better classes, and here the influence of Montaigne is obvious; school education is best only for those who cannot afford a tutor, who is to be carefully selected and make it his business to give his pupil a knowledge of world experiences. The contemporaneous humanistic education is severely criticized, and in its place an education through the senses is advocated. It is difficult to single out any one article as a complete exposition of the educational opinions represented by the work ; a full statement can only be attained by consulting numerous articles not on educational topics alone, but in philosophy, politics, and psychology.

See D'ALEMBERT ; DIDEROT ; ENCYCLOPEDIA; ENCYCLOPEDISM; ENLIGHTENMENT.

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END IN EDUCATION. — The ends or aims conventionally recognized for education are discipline (the sharpening of the mental faculties so-called), culture, and efficiency. As to both of the latter, either an individual or a social aspect may be emphasized; *e.g.* efficiency may be measured from the standpoint of power of personal achievement or from the standpoint of capacity to render social service. It is now generally recognized that discipline, efficiency, and culture are set over against one another only when each is taken in a narrow and one-sided way.

From the standpoint of philosophy, the most interesting problem regarding the aim of education is whether it is to be regarded as within or without the educational process; or, to put it in another way, whether education is a means to an end beyond itself or whether education is in some sense its own end. The former conception tends to look around for some external goal to which the educative process is contributary; then education is thought of as a mere getting ready, a preparation for a more or less remote future. From the opposite point of view, some thinkers, notably Emerson, have tended to think of education as itself the end of living, and to conceive wealth, social institutions, art, the external world itself, as having their ulterior value in the educational service they render. The strong point of the conception of culture as the end (when culture has been adequately conceived) is that it recognizes that education is as much an end for the other serious interests of life as they are ends for it. The conception of education as "a continuous making over of experience" is also calculated to avoid the notion of an external and remote end to which education is a mere means. J. D.

See Course of Study, Theory of; Culture; Education; Formal Discipline; Philosophy of Education; Values, Educational.

END ORGAN. — The name commonly applied to any part of the nervous system which lies at the surface of the body and receives impressions from the external world or transmits the stimulation from a motor fiber to an active organ. C. H. J.

See Nervous System.

ENDOWED SCHOOLS ACT, ENGLAND (1869). — An attempt to organize secondary education in England by regulating the administration of educational endowments through three commissioners, with the assistance of an expert staff. This act, which affected 3000 schools, with a gross income of £592,000, has been the cornerstone of English policy in regard to secondary education. The act appointed three Endowed Schools Commissioners with power to initiate schemes for the better application of educational endowments. It required that in all schemes provision should be made, so far as was conveniently possible, "for extending to girls the benefits of educational endowments." No endowments less than fifty years old were allowed to be touched by the commissioners without the consent of the governing body, and similar protection was given to schools connected with cathedrals and with the Society of Friends and the Moravians. The endowments of the seven public schools and of public elementary schools were excluded from the control of the Endowed Schools Commissioners. Any scheme framed by the Commissioners was to be sent to the Education Department for approval before being submitted to the Queen in Council. Petitions from persons affected by the scheme were to be considered by five members of the Privy Council, including two members of the Judicial Committee. The Privy Council might direct that a scheme petitioned against should be laid before Parliament. Furthermore, either House of Parliament might present an address against the whole or part of any scheme, in which case it was to be dropped or altered. When finally approved by the Queen in Council, the scheme acquired the force of an Act of Parliament. It made all headmasterships of those endowed schools which came under the act tenable by laymen. It protected the religious opinions of pupils in day and boarding schools by elaborate conscience clauses. It gave power to divert to educational uses those endowments, the original purpose of which had become socially obsolete. It enabled the commissioners to remodel the governing bodies of endowed schools upon a more representative basis. But in its original form the bill was far more comprehensive and statesmanlike. It provided for the establishment of a state examining board, which was to give certificates of efficiency to schoolmasters. No one was to be allowed to teach in an endowed school without holding such a certificate of competency, such certificates being also obtainable on a similar test by teachers in private schools. This part of the bill, however, was abandoned at an early stage. Its shipwreck marked the failure of the English middle class to organize secondary education upon German lines. Had the central authority of the State been armed in 1869, as Forster (*q.v.*) proposed, with this regulative power over the qualifications of teachers in secondary schools, secondary education would have been effectively organized from its base before the State undertook the great reform of elementary education. The secondary school teaching profession would have been established under government sanction, and would probably ere now have formed a branch of the Civil Service.

Higher grade schools, serving as a crown to the elementary schools, would have been established throughout the country upon a systematic plan, instead of being left to spring up sporadically and without distinct recognition in those cities in which the energy of the school boards and the weakness of conservative opposition made such somewhat irregular developments of the elementary schools practicable and popular. In the proposals of this part of Forster's bill we may trace the influence of his brother-in-law, Matthew Arnold. But the whole future of English education was changed by its abandonment. What remained of it, however, was sufficient to set going movements of reform which, when English local government was organized in 1888, quickly developed under the influence of the new local authorities. It is a question whether, if by an energetic propaganda Mr. Gladstone had prepared the public mind for the Endowed Schools Bill in its original form, opinion would have been found ripe to carry it in its entirety. As it was, the bill, even in its truncated form was in advance of public opinion. Aristocratic conservative influences and the suspicions of democracy were both adverse to the reorganization of secondary education under the authority of the State, both instinctively feeling that this step, if then taken, would have immensely fortified the position of the middle classes. But the latter showed themselves lethargic in their own interest, unimaginative in educational policy, distrustful of government action and (not a little to their credit) more concerned to help the poor and the unenfranchised than, by a long-sighted measure of self-preservation, to protect their own class interests in the State. It is not clear how far Forster himself realized the magnitude of the issues which turned upon the mutilation of his own bill.

Other aspects of this act and its relation to the development of English education in general are treated in the articles on ENGLAND, EDUCATION IN; GRAMMAR SCHOOL AND PARLIAMENTARY COMMISSIONS IN EDUCATION.

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ENDOWMENT OF COLLEGES AND UNIVERSITIES. — See UNIVERSITIES AND COLLEGES, ENDOWMENT OF.

ENDOWMENTS, EDUCATIONAL. — Ancient. — Education was connected with endowments and has been largely dependent on them ever since, in B.C. 347, Plato devised his house and garden near the Academy, a suburban gymnasium called after the local hero, Academus, in which he used to walk, talk, and teach, to his pupil and successor as a teacher, Speusippus. This house became an endowed college, and grew gradually richer from fresh endowments through its long life of 876 years, till A.D. 529, when, with all other endowments of the University of Athens (*q.v.*), it was disestablished and disendowed by the Emperor Justinian as a pagan and anti-Christian propaganda. At Alexandria, Ptolemy Soter and his son Philadelphus about 300 B.C. founded and endowed the Museum, the temple of the Muses, sarcastically dubbed by the wits "the hencoop of the Muses" because of the large contingent of scholars and professors who were lodged and boarded there and paid substantial stipends. Endowments thus began with university or tertiary education. It is not till the Roman Empire was more than a century old that there is evidence of any endowments for secondary education. Quintilian (*q.v.*) is the first endowed schoolmaster recorded ,and he is therefore said by St. Jerome (*q.v.*) to have kept the first "public school," because he received a stipend from the Emperor. But the first endowed school, in the sense of an endowment given by an individual with a view to defray part of the cost of the education to the parents, was that founded by Pliny the Younger at his native place, Como. In a letter to the historian Tacitus he says that he found a Como boy being sent to school at Milan, because there was no teacher at Como. He lectured the parents on the "small additional expense" a day school at Como would be compared to the cost of boarding boys at Milan. He gave sufficient endowments to find a third of the cost, and would have given more had he not been afraid of pauperizing the parents, and that "such an endowment might be corrupted to private interests, which he saw happen in many places where teachers were hired out of public funds." The Emperor, Antoninus Pius (138–63 A.D.), is said to have established offices and salaries (*honores et salaria*) for the rhetoric schools throughout the provinces, and Alexander Severus (221–235 A.D.) added exhibition endowments for poor boys, with the limitation *modo ingenuos*, so long as they were free-born. The Emperor Gratian in 376 A.D. made the municipalities provide endowments "out of the rates," and fixed a tariff. The rhetoric schoolmaster was to have twenty-four *annonae*, an *annona* being a year's living wage of a workingman; and the grammar schoolmaster half that. But at Trier, or Trèves, then the capital of the Western Empire, the rhetoric master was to have thirty, the Latin grammar master twenty, and the Greek grammar master, with the significant condition, "if one can be found," twelve *annonae* (*Cod. Theod.* xiii, 3, 11). In Gaul, in the fifth century, the invasions of the barbarians, the Burgundians, and Visigoths, swept away the municipal schools and the municipal institutions. When the invaders settled down, education, with other institutions, was no longer under the municipalities, the citizens, but under the bishops. (See BISHOPS' SCHOOLS.)

England.— In England the Saxon invasion had destroyed not only the Roman Empire, but whatever remained of the Roman, that is, the Christian, religion, and whatever churches and schools may have existed, with the Romans or Brito-Romans who, more or less, professed it. Consequently in England, when education begins again with St. Augustine of Canterbury (*q.v.*), it begins as an exotic education, and therefore in endowed schools. The schoolmasters were officers of the bishops, and endowed as part of the Church by the kings. In 598 Ethelbert of Kent, being baptized, " did not defer granting to his teachers a place befitting the dignity of their seat in Canterbury, his metropolis, and at the same time conferring on them necessary possessions of various kinds." Thence in 631 Sigebert, king of the East English, obtained masters and ushers, when he in turn, " with the assistance of Bishop Felix, whom he had obtained from Kent, set up a school in which boys might be taught grammar," as he had seen well ordered as an exile in Gaul, where he had been baptized. So too at York, a century later, education was endowed, being not only under the patronage of, but actually given by, the endowed archbishops themselves, Egbert (*q.v.*) and Albert or Ethelbert (*q.v.*). The first quasi-independent endowment of the school took place when, on the death of Albert, one of his pupils, Eaubald, became archbishop, and Alcuin schoolmaster. But the schoolmaster, though he became a separate cathedral officer, was maintained and lived, like the rest of the clerks or canons, as one only of the retinue of the bishop, maintained out of the general cathedral or episcopal revenues. These were not separated for another three or four hundred years, the bishop taking the bulk of the endowments as his own, leaving a lesser portion for the chapter. The eleventh and twelfth centuries saw this change take place. At York Thomas I, the first Norman archbishop separately endowed the schoolmaster (*Magister Scolarum*) about 1075. The Dean, and the Precentor, who looked after the Song School, were not separately endowed till 1090. At St. Paul's, London, a separate endowment was first given to the schoolmaster, (*c.* 1111,) when, by a deed still extant, the bishop gave him and annexed to his office a house by the Bell Tower and (*c.* 1127) granted the next master land at Fulham and the tithes of two churches near London. The schoolmaster was, however, not wholly maintained by the endowment, as in 1138 he obtained from the acting bishop a writ asserting his right to a monopoly of school keeping in London. In 1139 King Stephen endowed Salisbury School with three livings in Hampshire and their dependent chapels — an endowment of precisely the same kind as was given to Winchester and other schools up to the Reformation, and indeed up to the seventeenth century.

In 1179 an attempt was made to provide by general ecclesiastical law for the endowment of all cathedral schools, at least; Canon 18 of the Lateran Council of that year ordering that a competent benefice should be provided in every cathedral church for a master to teach the clerks of the church and all poor scholars gratis. It was probably in obedience to this canon that (*c.* 1181), Archbishop Roger of York endowed the school of York with £5 a year, payable out of the Rome-penny or Peter's pence, due to the Pope, and the synodical fees, due to the archbishop, of his three archdeaconries. Probably also this was the cause of the further endowment of St. Paul's School, London, in 1198, the bishop finding the endowments before given so scanty that the emolument of the mastership was little more than nominal, and giving it the tithes of Fulham, where the bishop's chief manor-house was and is, and 186 acres of land in various places near London.

About 1180, one of the earliest exhibition endowments was given for schoolboys at Durham. (See EXHIBITIONS.) About the same time Bury St. Edmund's School was endowed by the Abbot Sampson of Carlyle's *Past and Present* with a stone house, which he bought cheap from the Jews expelled from Bury, and with half a rectory, producing £5 a year; which seems to be a rich endowment for that time.

In 1215 the separation effected by another Lateran Council between the theological and grammar schools of the cathedrals and ancient collegiate churches, like Beverley, acted practically as a measure of disendowment for the latter, as the schoolmaster, who now took the title of Chancellor and confined himself to theology, took all the old endowments. The grammar schoolmaster was his deputy, and was paid a very small stipend by him, generally about £2 a year, as at Southwell Minster. The grammar schoolmaster was, however, further endowed by being given a vicar choralship or a chantry priesthood, or both, as at Lincoln; but he had no legal title to either, with the result that at Salisbury and at Wells the grammar schools came to be treated not only as unendowed, but as not even being a legal charge on the cathedral endowments at all in the eighteenth century, and perished for lack of them. Elsewhere this result was prevented by later endowments. Thus at St. Paul's, London, the school was saved by Colet's magnificent new endowment given in 1510, and at York by the annexation to the school of the endowments of a hospital for poor priests by Cardinal Pole in 1557.

It is a remarkable testimony to the thirst for learning and the felt want of higher or university education in the eleventh and thirteenth centuries that none of the universities were endowed. Paris, Bologna, Oxford, Cambridge, all grew up spontaneously like the philosophical schools of Hellas, to answer the demand of those who were prepared to pay for being taught, and, being mostly grown-up, or nearly so, were able to pay. The two old universities of England, even now, possess as such next to no endowments. The chief endowments there are those of colleges (*q.v.*), beginning with that of Merton at Oxford in 1264, and of Peterhouse at Cambridge in 1280, and of professorships beginning with those of the Lady Margaret, mother of Henry VII, in 1503.

Secondary education was always endowed, because all the early grammar schools formed part of the foundation of collegiate churches, the foundations of which were numerous before the Conquest and up to about 1150, and began again with renewed vigor about 1260. In the twelfth and first half of the thirteenth century, in those places where the schools were severed from collegiate churches, by the colleges being suppressed and their endowments given to monasteries, the earliest separate grammar school endowments are traceable. We have already noted this at Bury St. Edmund's in the twelfth century. At Derby, where the school was transferred from the collegiate church to a new monastery about 1150, a successful townsman, Walkelin, and his wife, Goda, came to the help of the school by giving their merchant's shop and some eight acres of land as an endowment, while their own house was to become a school and boarding house for the master and his clerks forever. At Colchester in Essex, a deed of 1206 gives evidence that the school there was endowed at least with a building, and perhaps with lands as well. At St. Alban's, Master Richard of Nantes, himself apparently the schoolmaster, endowed the school with a house in the town about the year 1286, the schoolmaster being bound to admit sixteen of the poorest scholars free in return for being thus relieved from hiring a house. His only other endowment was £1 6*s.* 8*d.* a year from the Almoner of the monastery for teaching the (probably) thirteen Almonry (*q.v.*) boys, and this was not earlier than 1330. At Pontefract a custom, already old in 1267, prescribed the partial endowment of the school by the loaves founded by St. Nicholas Hospital for its boys, as St. Cross Hospital at Winchester provided dinners daily for thirteen boys from its otherwise unendowed high school. In 1332 an endowment was given by Bishop Stapleton of Exeter for thirteen boys of the grammar school there in the shape of board, lodging, clothing, and private tuition in St. John's Hospital, which, after the Reformation, became wholly converted into an educational endowment. The Burghersh Chantry at Lincoln, founded in 1345, similarly provided lodging, board, and clothing for a few boys attending the grammar school there. Mountney's chantry at Chelmsford in Essex, founded in 1375, was a school endowment as well, the chantry priest being also bound to keep a grammar school; and was continued at the Dissolution in consequence.

Though there was no difference in the form of the foundation and the nature of its endowment between Winchester College and previous educational endowments of collegiate churches and others, yet an immense impetus to school endowments was undoubtedly given by William of Wykeham's foundation of that college in 1382, as it provided not only for the maintenance and pay of the schoolmasters, but for the maintenance and free education of the seventy scholars who with their warden formed the college itself. In 1384 Wykeham's foundation deed was imitated on the very much smaller scale of a master and two boys at Wotton-under-Edge by Lady Berkeley (*q.v.*) and in 1393 on precisely the same scale at Bredgar, Kent, by a body of subscribers. It is also probable that the endowment of the schoolmasters at Maldon and Rayleigh in Essex, both in 1388, by the guilds there, was also suggested by Winchester. The large number of chantries and guilds licensed about this time, which at the Dissolution were found to be maintaining grammar schools out of their endowments, may not, however, be due so much to the impulse given by Wykeham as to the registration and formal legalization of existing unlicensed institutions, made known to the authorities through the return of guilds required by the Crown in consequence of the Peasants' Revolt, in 1389. The endowment in 1412 of Durham Grammar School and another school at Middleton in Lancashire, his native place, by Thomas Langley, Bishop of Durham, is, however, a distinct following of Wykeham. So also was the incorporation of the previously unendowed grammar school at Higham Ferrers in Northamptonshire by Archbishop Chicheley, one of the earliest scholars of Winchester, in 1425, as part of his college, a smaller Winchester. Chicheley also followed Wykeham in utilizing the dissolved Alien Priories (*q.v.*) as a means of providing cheap endowments for education. The Alien Priories were religious houses in England, attached and paying rent to foreign houses abroad. They were mostly purely monastic, and did nothing for education. They were suppressed on political grounds to prevent their contributions to French houses, being used by the French as sinews of war against England. Some of them were made denizen, that is, naturalized as English monasteries and severing connection with the foreign head. William of Wykeham set the example of buying them up to serve as part of the endowment for his new colleges of Winchester and New College, Oxford. Henry V contemplated founding a great college of the Seven Sciences at Oxford out of their spoils. Archbishop Chicheley both himself bought several from the king to help to endow his two colleges of Higham Ferrers and All Souls at Oxford, and he with Beckington suggested to Henry VI their application to Eton College and King's

College, Cambridge, the endowments of which were larger than that of any other college or school in the kingdom, and almost entirely consisted of Alien Priories. It is curious that those historians who denounce Henry VIII in unmeasured terms for appropriating monastic endowments to education and other public purposes have nothing but praise for the sainted Henry VI for setting the example on a large scale. The ready mine of the Alien Priories heightened the standard of endowment. While Merton in 1274 thought £2 13*s.* 4*d.* a year ample for the scholar fellows of Merton College, and Wykeham in 1382 to 1400 provided sufficient to give the warden of Winchester £20 a year, the headmaster £10 a year and the fellows £5 a year, Henry VI raised the pay to £50 a year for the provost, £16 a year for the headmaster, and £7 a year for the fellows. So at St. Anthony's School in Threadneedle Street, London, a hospital served by alien canons regular was converted into a hospital served by secular clerks, with a school attached, in which the master got £16 a year.

The flow of endowments to education, stopped for a while during the period of depression caused by the disastrous wars in France and the Wars of the Roses in England, was renewed with unabated force from 1475 onwards. The endowment of Magdalen College and the two schools attached to it, at Oxford and at Wainfleet in Lincolnshire, by William Wayneflete, rivaled those of Wykeham and of Henry VI himself. The colleges of Acaster and Rotherham in Yorkshire by two successive chancellor bishops gave an enlarged scope to endowments by putting writing and arithmetic schools on the same footing as grammar and song or reading schools, as integral parts of the collegiate establishments, instead of being relegated to parish clerks who eked out their scanty clerical pay by teaching. The successful merchant, too, now came in to rival the successful churchman as a giver of endowments. One lord mayor after another, from Sir Edmund Shaw at Stockport in 1487 to Sir Stephen Jenyns at Wolverhampton in 1508, testified alike to the growth of commerce and the spread of education, accompanied by a desire to strengthen it by endowments placed under the government, not of ecclesiastics, but of laymen, the City Companies.

Meanwhile, a new mine of endowment was opened up when Wayneflete obtained the suppression of Selborne Priory, Hants, on account of its financial and moral failings, to endow Magdalen College at Oxford, thus applying the principle of the suppression of Alien Priories to those of home growth. This example was followed on a large scale by the pious Lady Margaret Tudor, mother of Henry VII, advised and assisted by Bishop Fisher, in the suppression of St. Radegund's nunnery to found Jesus College in 1497, and St. John's Hospital, kept by regular canons, to found St. John's College, Cambridge, in 1511. Cardinal Wolsey carried the precedent still further, and threw all former foundations into the shade, by the wholesale suppression of monasteries under Papal bulls to find endowments for his two great Cardinal colleges at Ipswich and at Oxford in 1527. The precedent was not lost upon Henry VIII, who found ample endowments for education in the possessions of the dissolved monasteries. With them he founded cathedral grammar schools (see Cathedral Schools), with large numbers of endowed scholars, ranging from fifty at Canterbury to twenty at Peterborough, and with endowments of not less than £20 to £30 to the headmaster, and for his two great colleges, Christ Church at Oxford, a reorganization of Wolsey's College, and Trinity, Cambridge. Unfortunately, while the two colleges are still the greatest, or among the greatest, endowed institutions in the country, the schools, since the schoolmasters were not members of the governing body, have been stinted and starved, and in consequence long eclipsed by foundations originally on a very much smaller basis.

The further progress of the Reformation in England under Edward VI was marked by a measure which, though not so intended, operated as a great disendowment of education, — the act for the dissolution of colleges and chantries in 1548. Provision was made in this act for the continuance of grammar schools and their reëndowment out of the dissolved chantries. But, as a fact, owing to the sale of the endowments and the failure to carry out the provision for reëndowment, except in some thirty cases, among which Sedbergh, in Yorkshire, and Birmingham are the most conspicuous, the measure resulted in the gradual decay from lack of endowment of the greater number of the schools. So, instead of Edward VI (*q.v.*) being the founder, as commonly supposed, he was in great part the destroyer or depraver of endowed schools. Queen Elizabeth (*q.v.*) has sometimes been represented as having given many endowments to education, but a careful inquiry has shown that a very large number of the schools professing to be founded by her or in her time were merely restorations or enlargements of pre-Edwardian schools.

The certificates of the commissioners under the Chantries Act have been only partially preserved; those of several counties, notably Norfolk and Suffolk, two of the most populous and prosperous counties in England at the time, are wholly missing. But they show (see Reformation and Education) 259 endowed grammar or secondary schools then existing. It is an underestimate to put the total number at 300, because, wherever close local research is brought to bear in old towns, a grammar school almost invariably appears. (See Chantry Schools.)

The same is largely true of the schools reputed to be founded by James I, or in his time, such as Evesham in Worcestershire and Otley in Yorkshire, both called Prince Henry's Schools, in honor of his eldest son, the Prince of Wales. The statistics given by the Schools Inquiry Commission as to the endowing of new schools in all these reigns, which has been quoted, even in this *Cyclopedia*, as authoritative, must be received with considerable skepticism and require to be subjected to close scrutiny in connection with local records before they can be accepted. The most curious instance of a really new foundation on the old model is that of the College of God's Gift at Dulwich, founded by the successful actor, Edward Alleyn (*q.v.*), in 1616, out of his professional profits. In close imitation of Winchester and Eton, it provided for a warden and three fellow masters and twelve scholars, but owing to lack of endowment was a failure for 300 years.

The bulk of endowments from the time of Charles I flowed to elementary education. Many of the schools were nominally grammar schools because the authorities seem to have been opposed to granting licenses in mortmain for anything else; but Latin is often mentioned *pro forma*, the master being directed to teach English grammar, writing, and arithmetic, and "Latin, if required," which it increasingly was not. During the Commonwealth (*q.v.*), when bishops and deans and chapters were dissolved, a serious attempt was made to apply their endowments to the augmentation of old and the foundation of new colleges, notably Durham, and to schools, especially in the North, the West, and in Wales, and among them largely to elementary schools. These all perished, and the endowments were restored to ecclesiastical purposes at the Restoration in 1660. For nearly 200 years not a single college was endowed at Cambridge, and only one at Oxford, and scarcely a single grammar school. But every year saw endowments given for new elementary schools, and from 1699 to 1800 for what were called *par excellence* charity schools (though all endowed schools are strictly and in law charity schools), schools in which children taken from the lowest classes were boarded and taught, the girls for domestic service, the boys for apprenticeship. (See CHARITY SCHOOLS.)

In 1828 a new series of endowments, by subscriptions from numerous subscribers rather than by single benefactors, for higher education of a quasi-university type, began with University College (undenominational), and King's College (Church of England), London, in 1828. This was followed in 1831 by the endowment of Durham University (*q.v.*) out of the revenues of Durham Cathedral, thus reverting to and justifying the action of the Commonwealth in 1657.

About 1848 a revival began in the endowment of grammar or "public" schools, secondary schools, chiefly boarding schools for the middle and lower-middle classes, commonly called colleges (*q.v.*), such as Cheltenham and Marlborough, Bradfield and Radley, Haileybury and Clifton. The reformation of the old schools by the Public Schools and Endowed Schools and Charity Commissioners produced a great flood of new endowments, in many cases amounting to refoundation, though these new endowments are generally given for particular objects, such as exhibitions, scholarships, and prizes for proficiency in particular subjects. In fact, more endowments have been given for this class of secondary education in the half century since 1850 than in the whole 250 years before. Meanwhile, the more and more complete transfer to the State and to local authorities of the control and financing of elementary schools since the Elementary Education Act, 1870, has resulted in an almost absolute cessation of endowments for that purpose. On the other hand, there had been a new large flow of endowments to university colleges, many of them now endowed into universities, beginning with Owens College, Manchester, 1851–1870, Mason College, Birmingham, 1870, Aberystwyth, 1572, Bristol, Leeds, Sheffield, Nottingham (not yet a university), Bangor, and Cardiff, which with Aberystwyth form the University of Wales. Technical colleges and schools have sprung out of or have been endowed in connection with the new universities.

From 1848 endowments have been poured on girls' and women's education, beginning with Queen's College, and Bedford College, London, in the following year; while there are now two endowed women's colleges at each of the ancient universities, Girton and Newnham at Cambridge, Somerville and Lady Margaret Hall at Oxford. Girls have also claimed, and in many cases been allowed, a share in the old grammar school endowments by the endowment of girls' schools out of their surplus; while new girls' schools have sprung up everywhere, which beginning in voluntary effort, like those of the Girls' Public Day Schools Company (*q.v.*), have been since converted into endowed schools. Such is the history of endowments for education in England.

A. F. L.

Theory of Endowments. — As to the philosophy of endowments, much has been said against them. One of the earliest important discussion of the question is found in Turgot's article on *Fondation*, contributed to the *Encyclopédie* in 1757. Here all types of endowments, religious, philanthropic, and educational, are considered. That Turgot did not look with favor on endowments is obvious from a sentence which comes early in the article: "A founder is a man who desires the effect of his own will to endure forever." However enlightened a founder may be, the aim of the endowment is to provide for an object which in all probabilty is limited in its effects, and not necessarily of general interest. "To enable a large number of men to live gratuitously is to subsidize idleness," for even though an endowment may in its origin be highly laudable, this spirit soon disappears, routine administration and regulations enter in, and it becomes impossible to fulfill the purpose of the founder. Frequently the prescriptions are so very narrow that it is easier to establish an entirely new foundation. But the chief objection against foundations in perpetuity is based on the fact that social needs change, and social institutions must admit of plasticity. Hence he claims it as an incontestable right of government on a basis of public utility "to dispose of old foundations, to extend their funds to new rights, or, better still, to suppress them altogether." "Are men powerfully interested in that good which you would procure for them? Leave them free to attain it; this is the great, the only principle."

The same *laissez-faire* attitude, with some qualifications, is adopted by Adam Smith (*q.v.*). With Turgot he holds that a position which is endowed is removed from competition and the consequent exertions, since the incumbent is already provided for, and is independent of success or reputation. So far as scholarships and exhibitions are concerned, colleges which provide these can always secure students without the necessity of competition with other colleges. Those parts of education which are not provided for by endowments are generally the best taught. Hence leave education to the general working of supply and demand, "were there no public institutions for education, no science would be taught for which there was not some demand." Dr. Chalmers (*q.v.*), in an essay *On the Use and Abuse of Literary and Ecclesiastical Endowments* (1827), denies the analogy between free trade in merchandise and learning; appetite for food may be a strong stimulus, but desire for education is not so potent. Accordingly endowments have their uses as setting standards and inviting coöperation and imitation. Further, unlike Smith, Chalmers argues that endowments are of great value in maintaining chairs in subjects which are important but not popular, holding that, while hunger does create a desire for food, a desire for learning by no means follows from ignorance. A somewhat similar view was held by John Stuart Mill, who was of the opinion that endowments could be usefully employed in promoting experimentation for purposes which do not at first commend themselves to general approval. Rev. R. J. Bryce, on the other hand, criticized before the National Association for the Promotion of Social Science (1860) both of the preceding views, and recommends the introduction of compulsory education, the training of teachers, and the proper use of existing endowments for the education of the poor and not as bounties for the rich. As early as 1838, George Long, in the publications of the Central Society (see EDUCATIONAL ASSOCIATIONS), had dealt with the history of educational endowments in England. He was of the opinion that, while the intention of donors should be followed, so far as possible, the legislature should have power to remedy defects when such intentions are not in accord with social progress. Long cites numerous cases from the law-courts which prove how a narrow interpretation of endowments has retarded education. The best known instance is, of course, the case of the Leeds Grammar School, where Lord Eldon (*q.v.*) refused to allow the introduction of modern subjects, on the ground that the donor had intended to found a "grammar" school only. Finally Sir Joshua Fitch (*q.v.*), who could speak with authority after examining a considerable number of endowed schools prior to the Endowed Schools Act (*q.v.*), contended that the public should have the same rights as a private legatee, and suggests as conditions under which endowments might be accepted that the object has worth, that the mode of attaining it is not too rigidly prescribed, that it is managed by a broad-minded governing body, that the State must supervise and make amendments where necessary for the benefit of the public.

Robert Lowe, Vice-President of the Committee of Council on Education, in 1865 stated emphatically that he had the poorest opinion of endowments, and was not sure that he would not abolish all educational endowments altogether. He based his objections on the ground that they give a premium to continue teaching things after the spirit of the age had got beyond them. This objection is in principle the same as that to endowments for any purpose, viz. that they are a vicious exception to the ordinary law, by enabling the dead-hand to retain its power over property which belongs to the living, and to dictate for all time in virtue of a transient possession to what purpose property, which only retains its value by the work of the living, shall be applied. In all countries, even in China, a law of mortmain to prevent land from falling into the dead-hand has at some time or other been found necessary and attempted. In principle the law which enables any one "to endow a college or a cat" forever during their lives is equally irreconcilable with the law of property as that which enables them to do so after death. But furthermore endowments by will, given, as many of them have been given, to spite relations who have had a reasonable expectation of succession, or by way of expiation of evil done in life, are even more in breach of the ordinary law and theory of property, as they involve no effort or sacrifice on the part of the giver, and are generally given with less forethought or planning of results. There does not appear to be any answer to the theoretical objection to endowments. But the practice of all civilized nations, and the public opinion in favor of the "pious founder," founded on admiration of particular endowments for particular objects of which they approve, perennially forgetful that there are many more endowments of objects of which they disapprove, have elevated the giving of endowments into an object of admiration. There is even a sort of competition among the rich, encouraged by the newspaper press, to attain posthumous merit as benefactors by endowments out of possessions which they cannot take with them. In view of the prejudice that exists in favor of this vicarious piety, it is hopeless to expect a real law of mortmain. In England, however, since the passing of the Andover Schools Act, 1869, the Board of Education Act, 1899, and the Education Act, 1902, the powers of the State to revise endowments have to a considerable extent, as regards secondary education, lessened the evils pointed out by Robert Lowe. The stereotyping of subjects and methods of instruction, the exclusion of new ideas and new subjects, are less rigorous. But in the sphere of higher education the difficulty of revision is as great as ever. The universities and colleges still require a *deus ex machina*, in the shape of a Parliamentary Commission, to effect reform. Experience has shown that it is hopeless to expect it from those who are themselves endowed for specific purposes, however obsolete. An absolute and uncontrolled power to the Board of Education of revising all educational endowments more than forty years old is necessary if endowments are not to continue to be mischievous by continuing to encourage the teaching of subjects not according to the wishes and wants of the living parent and child, but according to the fancies and prejudices of the past. (See also PHILANTHROPY, EDUCATIONAL.)

A. F. L. and I. L. K.

United States. — One of the earliest indications of educational interest in colonial history is the giving of endowments to found or to assist educational institutions. In no respect is the transference of English custom and the European attitude toward education better evidenced. And the giving of money or other forms of wealth for education is found in connection with every type of educational institution, elementary, secondary, and higher.

As early as 1618 both the government and public-spirited individuals had offered endowments for a college at Henrico. The private contributions had been collected by the bishops of the Church of England at the "command" of the King during the two years previous. The company itself set aside 10,000 acres of land. Through various circumstances, chiefly an Indian massacre, this movement came to nought. The so-called "East India" school was endowed from a collection of £70 taken on a ship of the East India Company, supplemented later by other collections. In 1643 an endowment for a free school was given by Benjamin Simms, and still later in the century came the endowments for the first college, William and Mary (*q.v.*), contributed to by private subscription as well as by royalty. (See COLONIAL PERIOD IN AMERICAN EDUCATION; VIRGINIA.)

In Massachusetts the history is similar. The most notable endowment was the gift of John Harvard (*q.v.*) of £728 and his library to the institution which bears his name. The great number of private gifts which followed were not so much for the purpose of creating an endowment as for current needs, though the two purposes were not always kept distinct. The most immediate needs were land and buildings, and these could hardly be distinguished from endowments.

The early towns of New England frequently, if not usually, made grants of lands to the town school to serve as endowments. But when land was to be had almost for the asking, it was not very productive as an endowment, so that it was not until late in the seventeenth or early in the eighteenth century that such grants became of much profit. Endowments are found for only a few, and these not of great amount. Boston received a legacy of £10 in 1655; Dedham of £60 in 1680, and £100 in 1749; Broklyn of £308, "half Johannes," in 1762, Newbury of £100 in 1779. In a similar way, grants of land were frequently made. Most of these were to the Latin School, but sometimes the two schools were not distinct. By the middle of the eighteenth century the support of both Latin and elementary schools had become public in practically all of the Massachusetts towns.

During the latter part of the eighteenth century a new type of school sprang up which called forth endowment gifts at first. These were the academies. These endowments began with the gifts of the Phillips family to the academies at Andover and Exeter which bear their name. (See ACADEMIES.) Again, the willingness of the public to support these or similar institutions destroyed the need for private endowment. The various states came to the support of academies in great number, and high schools developed after 1821. Only a few of the academies accumulated any considerable endowment funds, and most of those developed from secondary schools into colleges.

It is the college which in America has attracted the vast amount of philanthropic gifts to education. The entire system of four to five hundred institutions of accepted collegiate standing, with the almost similar number bearing the name but not attaining to the full standard of collegiate work, are most of them founded by private gifts, and all which have any permanency, with the exception of a few of the state institutions, are supported by endowments made as charitable gifts. The development of this phase of educational support is one of the most striking phases of American educational history. It will be discussed more fully under the title, PHILANTHROPY, EDUCATIONAL (*q.v.*). The importance of endowments in the history and life of particular institutions is indicated in the articles on the various colleges and universities. The general significance and extent of endowments is discussed in the articles on COLLEGES, AMERICAN; and UNIVERSITIES, ENDOWED AMERICAN.

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ENDURANCE. — See FATIGUE.

ENGINEERING. — See TECHNICAL EDUCATION.

ENGLAND, EDUCATION IN. — **History.** — The history of English education is typical of the history of English institutions. It has been built up by a long series of experiments and compromises; it has been guided by a sense of the practical, and has been a response to the need of the moment rather than the result of theorizing, or a well-considered plan and purpose. Hence the history of English education is the history of movements or of forces which have determined its evolution. A national system of education England never had until the close of the nineteenth century. Few nations show the influence of so many different forces in their educational history as may be recognized in that of England, — the Church, the State, economic conditions, private enterprise, philanthropic endeavor, educational theories, — all have contributed some tradition to what is gradually developing into a well defined system. This being so, it would be difficult within the limits of one article to do more than refer to the numerous topics which deal more fully with the different phases of that development. This article is concerned mainly with the more recent development of the nineteenth century, in which the State has more and more attempted to weld the different forces into a system. While a division is made into periods, this is only done for convenience in grouping, for no one type is necessarily confined within the limits of the period in which it is placed.

Medieval Period. — While some traces of the earliest dawn of education in England is given in the article on Druids and Education, and in Roman Imperial Education in Great Britain, the characteristic medieval influence is that of the Church, as may be seen by reference to the different types of schools of the period: Almonry Schools, Cathedral Schools, Chancellor's Schools, Chantry Schools, Chorister Schools, Cloister Schools, Collegiate Church Schools, Convent Schools, York School, Jarrow School. Other aspects of medieval education are treated in the articles on the Alien Priories; Boy Bishop; Benefit of Clergy; Bible in the Schools; Church Attendance of Pupils; Chancellor; Canon Law in Education; Cloveshoo, Council of; Clerk; Magister Scholarum; Monasticism; Teachers, Licensing of; Universities; Scholasticism. The articles on the leading educators will also contribute some suggestions on the education of their period, as Augustine of Canterbury; Adrian; Alfred; Ælfric; Albert of York; Aldhelm; Biscop; Bede; Egbert of York; Patrick, St., and others. The secular or political influences on medieval English education are reflected in the articles on Anglo-Saxon Schools; Anglo-Norman Dialect; Anglo-Norman Schoolbooks; Bibelesworth; Black Death and Education; College; Common Law and Education; Common Master of the Town; Chivalric Education; Gentry and Nobles, Education of; Guilds and Education; Henry II; Henry VI; Eton College; Lollards' Schools; Manor Schools; Fees; Punishment, Corporal; Song Schools; School. The main features are contained in the summary article Middle Ages, Education in the.

Renaissance and Reformation. — The two movements coalesce in English education, and are marked mainly by the movements in secondary education which are treated under Henry VIII; Edward VI; Elizabethan Education; Endowments; Free Schools; Fees; Grammar Schools; Gentry and Nobles, Education of; Reformation and Education. The Renaissance aspect is covered mainly in the biographies of the remarkably large number of educators and others who interested themselves in the theory and practice of education. The most notable only of these can be mentioned here: Ascham; Baret; Brinsley; Colet; Coote; Dury; Eliot; Gilbert, Sir H.; Hoole; Knox, John; Lily; Mulcaster; Udall. Further the following articles may be consulted for school practice: Barring out the Teacher; Cockfighting; Declamation; Dictamen; Disputation; Dormitories; Fagging; Usher; Manners, Teaching of; Greek, Hebrew, Latin, and other school subjects. State intervention is treated in the articles on Apprenticeship and Education; Dissenters in Education; Poor Law and Education; and Teachers, Licensing of.

Seventeenth and Eighteenth Centuries. — The first of these two periods is marked by a struggle between the Established Church and dissenting bodies, the former insisting on a monopoly of education. This phase is brought out in the articles on Academies, Nonconformist; Dissenters and Education; Common Law in English Education; Commonwealth in England and Education. The realistic influences of this period are reflected in the articles on Bacon, Francis; Boyle, Robert; Royal Society; Eachard; Hartlib, S.; Milton, J.; Locke, J. The combination of religious and philanthropic endeavor with education may be traced in the articles on Baxter, Richard; Bray, T; Charity Schools; Charitable Trusts for Education; Circulating Charity Schools; Gouge, Thomas; Society for the Promotion of Christian Knowledge; Society for the Propagation of the Gospel; Wales, Education in. The course of education in the next century is treated in the articles on Eighteenth Century and Education; and in the biographies such as Burke; Blackstone; Chesterfield; Cowley; Cowper; Day; Defoe; Edgeworth, R. L., and Mary; Goldsmith; Gray; Hume; Mandeville; Pope; Smith, Adam.

Nineteenth Century. — While the main trend of the nineteenth-century movement in English education is treated in outline in the present article, especially from the date of the first state grant, the following articles may be read as supplements on other issues. The monitorial system is treated both separately and also under Bell; Lancaster; British and Foreign School Society; National Society; Borough Road Training College. Different types of education are dealt with in the following topics: Adults, Education of; Apprenticeship and Education; Boys' Brigades; Continuation Schools; Evening Schools; Technical Education; Preparatory Schools; Public Schools; Grammar Schools; Endowed Schools Act; and Eton, Harrow, St. Paul's, etc. Higher education will be found under the general article Universities, and under the separate universities, as Oxford, Cambridge, London, Manchester, etc; University Extension; Workingmen's Colleges; Degrees; Tripos; Wranglers, etc. Administrative aspects are treated under Apportionment of School Funds; Attendance, Compulsory; Cost of Education; Cockerton Judgment; Cowper-Temple Clause; Education Committee of the Privy Council; Lords, House of, and Education; Examinations; Official State Publications of Education; Child Labor; Childhood, Legislation for Conservation and Protection of; State Intervention; School Board System. For this, as well as the preceding centuries, see also Poor Law and Education. Questions relating to teachers are covered by the following topics: Certification of Teachers; Education, Academic Study of; Pensions; Pupil Teachers; Salaries; Teachers' Agencies; Teachers, Appointment of; Teachers' Tenure; Teachers, Training of; Teachers' Voluntary Associations; Training Colleges. School practice is dealt with under Athletics; Examinations, and the various subjects of the curriculum; Holidays, School; Parents and Schools; Punishment, Corporal; Vacations, School, etc. The articles on Bible in the Schools; Moral Education; Nonconformists in Education; Religious Education; Sunday Schools, etc., deal with the field of religious education. The debt due from English education to foreign influences is traced in the two articles French Influences in English Education, and German Influences in English Education. Lastly the activity and contributions of English leaders to the recent educational development may be found under the biographical notices of Acland, Sir Thomas; Arnold, Matthew; Arnold, Thomas; Allen, William; Bain, Alexander; Beale, Dorothea; Buss, Francis M.; Bradley, George G.; Besant, Sir W.; Brougham, Lord; Clough, A. J.; Dickens, Charles; Faraday, Michael; Fawcett, Henry; Fielden, Sarah; Fitch, Sir Joshua; Forster, William E.; Galton, Sir Francis; Gladstone, William Ewart; Hamilton, Sir William; Hawtrey, Edward C.; Hill, Thomas Wright; Hogg, Quintin; Huxley, Thomas H.; Kay-Shuttleworth, Sir James; Kennedy, Benjamin H.; Laurie, Samuel S.; Lowe, Robert; Quick, Robert H.; Payne, Joseph; Pounds, John; Raikes, Robert; Russell, Lord John; Spencer, Herbert; Stanley, Edward G.; Walker, Frederick A.; Whewell, William; Whitbread Samuel; Wyse, Sir Thomas. Other topics, which are treated in more detail than is possible in the following account, are marked by a cross-reference.

Development of a National System. — The internal disorders of England brought about by the wresting of industry from its wonted grooves were aggravated in the early years of the nineteenth century by the struggle with Napoleon and the subsequent contest with America. These wars enriched the landowners and capitalists, but impoverished the poor, and increased their bitterness toward the rich and powerful. At the same time new conceptions of the functions of government which had been advocated by philosophical writers, by Adam Smith, by Bentham and Blackstone, and new doctrines, exemplified in particular by Robert Owen, founder of English socialism, began to take shape in reform measures urged upon Parliament and agitated in the press.

The Factory Act of 1802 marked the advent of Parliament as a controlling factor in the education of the industrial masses. By the sixth section of the act, provision for the instruction of young apprentices was made obligatory upon the master or mistress of such apprentices, and though persistently evaded by parents and employers the clause fixed an important precedent in English law. (See Factory Schools.) A simple bill to provide schools where none existed, introduced by Mr. Whitbread (*q.v.*) in the House of Commons in 1807, was pared down to the smallest terms and then lost in the House of Lords. Eight years later the subject was renewed in the lower house by Mr. Brougham (*q.v.*), who waged the losing campaign with unflagging energy. His education bill, introduced in 1820, but foredoomed to failure, is of chief interest to-day as an index to the denominational forces which have stubbornly contended at every step in the progress of national education. The positive achievements of this brilliant leader were the commissions of inquiry whose appointment he secured; one, in 1816, on the state of popular education in the Metropolis; the second (1818) on endowed schools. The mass of information thus brought together and Brougham's personal appeals to popular opinion contributed powerfully to the final success of the cause for which he stood.

The First Grant for Elementary Education.—The passage of the reform bill in 1832, which greatly extended the franchise in England, awakened a new sense of peril from the ignorance of the masses, and in the following year (1833) the first Parliamentary grant, £20,000 ($100,000) was made for elementary education. The money was applied solely to the erection of schoolhouses and in aid of private subscriptions for the purpose. Thus at length Lord Brougham's dictum, " The education of the people is a matter of vital concern," was wrought in English law and precedent. By the terms of the treasury minute adopted Aug. 30, 1833, assistance from the grant was only allowed upon satisfactory reports as to the application from either the National Society (*q.v.*) or the British and Foreign School Society (*q.v.*). For six years the two societies controlled the distribution of the grant, and down to 1870 their influence was paramount in shaping the spirit and methods of elementary education. Thus by its origin the national system acquired the main characteristics of the earlier voluntary systems. It inherited from them the monitorial expedient, which developed into the pupil-teacher system, and training colleges for teachers, with their dual relation to State and Church. Official regulations and an official inspectorate were, however, a constant reminder of the reserved power of the State in this growing interest.

The period from 1833 to 1870 was marked by the extension of government action through existing agencies. In 1839 the annual grant was increased to £30,000 ($150,000), to be applied without restriction for purposes of elementary education; the same year a separate Committee of the Privy Council was appointed to take charge of grants voted by Parliament for education. In 1847 Roman Catholic and Wesleyan Associations were admitted to the benefit of the annual grant. In 1856 a Vice-President of the Committee of Council on Education was appointed and made directly responsible to the House of Commons for the distribution of the sum voted by them for the promotion of education. The growing importance of the interest led in 1858 to the appointment of a Royal Commission (Duke of Newcastle's Commission) to inquire into the state of popular education in the country. The report of that Commission, presented in 1861, made many recommendations, but the only one of these that was put into immediate effect introduced into the system the evils of " payment upon results." Under the plan as embodied in the *Revised Code* (Mr. Lowe's), 1861, the amount of grant allowed a school, and, hence, the prospect and position of the teachers, were made dependent upon " the individual examination " of pupils.

While the government was holding thus firmly to a narrow system of state aid for education through the agency of private bodies, public opinion on the subject was making rapid advance, especially in the great centers of population. In Manchester a committee was organized to promote a general system of secular education in the county of Lancaster. This committee subsequently expanded into " The National Public School Association," which advocated secular schools supported by local taxes and managed by local committees throughout the kingdom. Later a similar movement was started in Birmingham, which expanded into the famous " League " and kept up the agitation for a secular system of free schools till 1877. The movement soon spread to every principal town in England. It was offset by the Manchester and Salford Committee, formed in the interests of state-aided denominational schools.

Education Act of 1870. — The electoral reform of 1868 and the sweeping Liberal majorities that followed caused the reopening of the education question in Parliament, and on the 17th of February, 1870, Mr. Forster's celebrated bill was presented to the House of Commons. It was a compromise measure, and so distinctly favorable to the denominational school system that it excited tremendous opposition in the ranks of the Liberals and a most acrimonious debate within the House itself. A deputation from the Birmingham League, headed by the chairman, Mr. Chamberlain, waited upon Premier Gladstone to protest against the measure; they were followed by the Welsh Educational Alliance. But in spite of opposition, the bill became law, and has formed the groundwork of all subsequent school legislation in England.

According to the statement of Mr. Forster in his speech presenting his bill, the state-aided system was educating at the time, " more or less imperfectly," 1,500,000 children. Many of these were mere infants; of the children between six and ten years of age it was estimated that 700,000 were in the aided schools, against

1,000,000 who were "neglected"; of those between ten and twelve, 250,000 were in the schools and 500,000 not accounted for.

In its original form the bill proposed that school boards in municipal districts should be elected by the town councils. Owing to the chaos of English local government, there were no suitable corresponding local authorities outside the municipal areas. Forster was therefore driven to propose that in nonmunicipal districts a new local authority, the school board, should, where deficiency in school accommodation compelled its formation, be elected by direct popular vote. It was originally proposed that the school boards should have power not only to establish, where necessary, schools under their own management, but to aid out of rates existing voluntary schools, on condition, however, that where such aid was given schools of all denominations should be regarded as having an equal claim to such assistance. The school boards were to be left perfectly free in their regulation of the religious teaching given in schools under their direct control.

In the course of Parliamentary discussion, often embittered and perilous to the government, the original framework of the bill was greatly changed. The municipal school board was abandoned. A new local authority elected *ad hoc* was in all cases to act as a school board. In the case of its own schools, the latter was forbidden, in the words of the Cowper-Temple clause, to allow "any religious catechism or religious formulary which is distinctive of any particular denomination" to be taught to the scholars. It might, if it so preferred, provide no religious instruction at all. The voluntary schools were disqualified from receiving any aid from rates, and were given an increased grant from the Parliamentary vote. Thus the bill set up in unstable equilibrium the new board schools and the voluntary schools as two parts of a dual system of elementary education. The idea of a municipal authority in elementary education could not be realized till the year 1902, when the working of the Local Government Act of 1888, had covered the whole country with a common type of local authority.

Mr. Forster's act was the real, though belated, beginning of the present organized system of national education in England. Something like it ought to have been passed forty, or even sixty, years earlier. English life has never recovered from this protracted delay in the systematic organization of public schools. One root cause of the delay was the absence of any complete system of representative local government throughout the country. Without this, educational statesmen had no local administrative foundation upon which to build. Thus voluntary effort, necessary and beneficial as it was, had time to harden into vested interests with which the State could not easily contend, and conflicts of opinion upon religious questions, combined with the more hidden influences of class separation, gained undue power in determining not only the course of the educational controversy, but in affecting the action of the State itself. The weakest points in Forster's own bill were due to the lack of a sufficiency of representative institutions for local government in England and Wales. But his act carried three great principles into effect. It established a compulsory local rate for education where deficiencies in school supply were not met by voluntary effort. It set up a representative local education authority in all districts where public opinion demanded it, or where the failure of voluntary effort rendered it necessary. And it introduced, though at the option of the new local authorities, the principle of compulsory attendance at school. An enduring national system, however, was not created by this bill. But the foundations of a national system were laid, and the machinery of a public system was introduced.

The Act declared that there should "be provided for every school district a sufficient amount of accommodation in public elementary schools available for all the children resident in the district, for whose elementary education efficient or suitable provision is not otherwise made." When there was insufficient accommodation, the act prescribed the manner in which it should be supplied. An elementary school was defined as "a school or department of a school at which elementary education is the principal part of the education there given, and not including any school or department of a school at which the ordinary payments in respect of instruction for each scholar exceed nine pence a week." All public elementary schools were required to be open to government inspection and to conform with the regulations of the Education Department as laid down in the annual code. Any religious teaching or religious observance in the school was required to be given at the beginning or end of a school meeting, in order that, under the conscience clause, any scholar might, at his parents' request be withdrawn from it (sec. 7, 1–23). After due inquiry, the Education Department was to publish a notice of the public school accommodation necessary in each district in England and Wales. If voluntary effort could not supply this accommodation within a reasonable time, or if existing voluntary schools were not likely to be maintained, or if the electors applied for a school board, the Department might order the formation of a school board in every district (a borough or a parish or a combination of these) to be elected triennially by the cumulative vote, in a borough by the burgesses and in a parish by the ratepayers. Women, if independent ratepayers, were entitled to vote equally with men, and any candidate, male or female, resident or nonresident, was eligible for election. Any school board failing in its duties could be declared in default by the Education Department, which had power to appoint a school board to act in its place. The duty of the school board was to maintain and keep efficient every school provided by them, and to provide such additional accommodation as the members thought necessary. The local rating authority (the council in a borough, the overseers in parishes) were required at the request of the school board to pay the money needed for the purpose by the school board over and above the sums which the latter received from the parliamentary grant, from loans, and from pupils' fees. Any school board might, with the consent of the Education Department, make by-laws requiring the attendance at school of all children between the ages of five and thirteen. In the districts in which there was no school board, no provision for compulsory education existed till 1876. Board schools and voluntary schools received the Parliamentary grant on equal terms, but only the board schools might be aided out of rates. The difference in the case of voluntary schools (as well as the cost of buildings) had to be met out of voluntary subscriptions. (In this connection it may be mentioned that 1500 new buildings were obtained for voluntary schools within the year, for by the act before any district could be forced to establish a board school, six months were to be allowed for this deficiency of accommodation to be made up by private effort.)

The amount of the government grant in each case was determined by compliance with specified conditions as to buildings and teaching staff and " the results " of the teaching of elementary branches as reported by government inspectors. It was further proportioned to the amount raised from local sources. These comprised, for voluntary schools, income from subscriptions, endowments, and fees; for board schools, local taxes and fees. The grant, which reached in 1870 the sum of £562,000 ($2,810,000), it was anticipated, would eventually furnish 50 per cent of the school income. This proportion, however, was soon exceeded. The grant was strictly limited to schools " public " and " elementary." As defined in the law, a public school was one fulfilling the legal provisions in regard to religious instruction and the code requirements, and open to government inspection; an elementary school was one in which the main part of the education given was elementary and in which the ordinary fee for each pupil did not exceed ninepence a week. School boards were authorized to contribute to the establishment of industrial schools for neglected and abandoned children, and, with the consent of the Education Department, to establish such schools themselves.

For three decades the dual system of elementary schools was developed on the basis of the act of 1870 by successive enactments, of which the principal were as follows.

Education Acts (1870–1902). — *Compulsory School Attendance.* — By an act of 1876 the authority given to school boards to make compulsory by-laws with penalties for violation was extended to school attendance committees in districts having no school board; it was provided that the annual grant to a school might exceed the local income, but limited the excess to 17*s.* 6*d.* per capita of average attendance; employment of children under fourteen years of age was restricted. In 1880 an act requiring school boards and school attendance committees to make compulsory by-laws with adequate means of enforcement was passed.

Free Tuition. — The act of 1891 provided for an extra grant in lieu of fees at the rate of 10*s.* per capita of average attendance for all schools remitting fees.

Age of Exemption from School Attendance. — The act of 1893 made eleven years the minimum age for exemption from school attendance and required an examination in a standard not lower than the fourth for every child seeking exemption from school attendance. The minimum age for exemption from school attendance was raised by an act of 1899 from eleven to twelve years, with special provision for children employed in agriculture.

Schools for Defectives. — By laws of 1893 and 1899 school boards were authorized to make special provision for the elementary instruction of blind children, of deaf and dumb children, and of defective and epileptic children.

Special Legislation. — The first radical departure from the principles of the original measure was made by the act of 1897, providing a special grant for the benefit of " voluntary " schools at the rate of 5*s.* per capita of average attendance, and repealing the 17*s.*6*d.* limit ; also authorizing the federation of voluntary schools and the allotment of the grant at the discretion of the governing bodies of the federations.

Superannuation Law of 1898. — This law provides for the retirement of teachers for age (sixty-five years) or disability with an annual allowance. The allowance is made up partly by an annuity purchased by small sums — £3 for a man and £2 for a woman — deducted annually from each teacher's salary, and partly by a state pension calculated according to the years of actual service performed by the teacher. (See PENSIONS, TEACHERS'.)

The laws above cited pertain solely to the province of elementary education ; but meanwhile forces within the system and pressure from without had made it impossible to maintain the work any longer separate from all other scholastic agencies. Government recognition of this fact was indicated by the adoption of two measures which completely changed the public administration of education, broke up the isolation of the elementary system, and provided for its coördination with other departments.

New Administrative Authorities. — *The Central Education Authority.* — By an act of 1899 a Central Board of Education was created, and to it were transferred the educational functions hitherto performed by the following bodies : The Committee of Council on Education, one division of which administered the grant for elementary schools and another division the grant for science and art schools ; the Charity Commissioners, as related to the reorganization of educational trusts and endowments ; and the Board of Agriculture. The law did not limit the duties of the new board to elementary education ; it provided for "a consultative committee to be constituted by an order in council, consisting of persons qualified to represent the views of universities and other bodies interested in education for the purpose of framing, with the approval of the Board of Education, regulations for a register of teachers" and of "advising the Board of Education on any matter referred to them by the Board." The law also authorized the Board "to inspect any school supplying secondary education and desiring to be inspected."

Local Authorities. — In accordance with the act of 1870, voluntary schools were under the exclusive control of private managers; elected school boards had control of the public elementary schools, and through their right to claim rates commanded almost unlimited resources. By the Education Act of 1902, the school boards were abolished and the local control of schools passed to the civil councils of counties and county boroughs. By this act, also, voluntary schools were admitted to share in the local taxes, but without local control. Thus was accomplished not only a complete change in school administration, but a radical departure from long-cherished principles.

The Annual Codes. — Down to the year 1902 legislation tended to the one purpose of bringing every child in the kingdom under instruction. Meanwhile the government made itself felt also in the inner workings of the schools. The service of inspection was based, however, upon the right of the State to guard its appropriations instead of its inherent right to regulate the education of future citizens. Consequently the annual codes or regulations, issued by the Education Department with the sanction of Parliament, simply set forth the minimum conditions upon which a school may share in the grant for the year. These conditions, though modified in detail from time to time, have remained unchanged in the essentials included, namely school buildings and equipments, the number and qualifications of teachers, the length of the school session, the attendance of pupils, and the proofs of efficient instruction. Distinct provisions in all these respects are made for the different classes of schools included in the elementary system. These are infant schools (originally for children under seven years of age), schools for older pupils (which comprised at first six standards or grades, subsequently increased to seven), evening schools (at present included under higher education), and training colleges for teachers.

By the code of 1871, the first issued after the Forster law was passed, a school on the inspection list, above the infant grade, received 6*s*. per pupil in average attendance, 4*s*. for every pass in each of the three elementary studies, or a total of 12*s*. per pupil on the results basis, which sum might be augmented by a grant of 3*s*. for every pass in specific subjects, but no pupil could present more than two subjects of this class. To be recognized for the grant a school must have met not less than 400 times during the year, and pupils presented for examination must have attended not less than 250 times (150 in the case of half-timers) for a minimum daily session of two hours. It was required that the head teacher should be certificated, and that the staff should bear a certain proportion to the number of pupils. The total grant for an individual school was originally restricted to the amount derived from local sources. In 1876 this requirement was replaced by the condition that the total grant to a school should not exceed 17*s*. 6*d*. per capita of average attendance unless the excess was met by an equal sum from local sources. The first important change in the requirements for participation in the annual grant was made by the code of 1882 (Mundella Code), which introduced a merit grant to be awarded at the rate of 1*s*. to 3*s*. per capita on the basis of average attendance . The code of 1895 substituted for the annual formal examinations two annual visits by the inspector, to be made without notice, and recognized average attendance as the basis for nearly the whole grant ; this arrangement ended the results system, consolidated the grants, and gave greater freedom to teachers.

The codes have been equally explicit as to the grant requirements for infant and evening schools, but the particulars cited illustrate sufficiently the economic principles upon which the annual grant has been distributed. The excessive regard for the formal side of school processes, fostered by this principle, has had the effect of insuring a definite program for every elementary school of England, and very exact information as to the state of school attendance throughout the country. Meanwhile other influences have been working toward the adoption of sounder educational principles.

Distinctive Features. — The English system of elementary education was distinguished from the first by the provisions respecting religious instruction, the attendance of half-timers, and the training of teachers. These features still persist, but they have been greatly modified by recent events.

Religious Instruction. — Before 1870 no school was subsidized unless connected with the Church of England, the Roman Catholic

Church, or the Wesleyan Church, all of which required the Church doctrines to be taught, while the British and Foreign School Society required the Bible to be read, etc. The state inspectors, with the consent of the managers, were free to examine the religious teaching, and the State paid grants in regard to it. The act of 1870, on the contrary, expressly limited inspection and grants to secular subjects, but it did not forbid religious teaching to be given, if the managers of the school decided to provide it. The central government was to be secular or neutral; the local managers of each school might decide whether any, and, if so, what, religious teaching should be given in their school, subject to restrictions which would make every public elementary school "suitable" for all denominations.

The safeguards provided by the act of 1870 have already been explained. In practice the conscience clause providing for withdrawal from the religious instruction in voluntary schools has proved of little value. As regards board (now council) schools, a few local authorities forbid the teachers to mention religious subjects at all, some provide a simple prayer and hymn, others have Bible reading with or without comment, and a few give place to theological dogma. But whatever the authorities do in regard to this delicate point, they do it on their own responsibility, on the initiative and under the direction of their constituents. The State neither directs, nor controls, nor supervises this teaching.

Exemption from School Attendance. — Total and partial exemptions and the system of half-timers have grown out of the relation of the education acts to the factory acts. The factory act of 1802 first made education compulsory in England for any class of children of private individuals living in their own homes. The act forbade the employment of any child between nine and thirteen years of age, unless provided with a certificate showing that he had attended school two hours on six days in each preceding week. By subsequent acts the age limits were made ten to thirteen, and the prohibitions as to employment extended to nontextile factories and in a less stringent form to workshops. At present the factory acts and the education acts agree as far as regards school hours. Both prohibit the employment of a child under twelve years of age (apart from agriculture); neither set of statutes places any restriction (except those relating to "young persons") after the age of fourteen.

It should be noted that the education acts relate simply to school hours, while the factory acts either limit the hours strictly or prohibit work in a factory altogether; a child under age may not be employed there at any hour of the day; a half-timer may only work so many hours or so many days a week. At the age of twelve, and until they are thirteen, children under the factory acts can only be employed half time; in the case of most by-laws made under the education acts they can qualify for total exemption on reaching twelve. (See CHILD LABOR.) If the by-laws contain a special provision to this effect, children may be employed in agriculture at the age of eleven, provided that they attend school 250 times a year up to the age of thirteen.

According to the official regulations, the term "half-time scholar" means a scholar certified by the local authority to be employed in conformity with the by-laws, or, if not subject to the by-laws, in conformity with the elementary education act, 1876, or any other act regulating the education of children employed in labor, and in either case recognized by the department as a half-time scholar.

"An attendance" means attendance at secular instruction (*a*) during one hour and a half in the case of a scholar in a school or class for infants; (*b*) during two hours in the case of a scholar in a school or class for older children; and during one hour and twenty minutes in the case of a half-time scholar.

Training of Teachers. — This topic will be treated in a separate article. See TEACHERS, TRAINING OF.

Growth of the System (1873–1902). — The growth and magnitude of this system during the three decades under the law of 1870 are shown by the following tables, which bring into comparative view the enrollment of pupils and the annual expenditure for the schools at the beginning of each of the periods included. In 1873, the first date selected, the law of 1870 was in full operation; in 1883 the compulsory principle had become well established; and by 1893 the "fee grant" provided by the law of 1891 had brought the great body of the schools to a free basis, more than four fifths of the schools having at that date remitted fees, and 4,236,867 pupils, above 82 per cent of the total number, having the benefit of free tuition. In 1903, when the education law of 1902 was just coming into operation, the proportion of free schools had risen to 93 per cent.

From Table I it will be seen that throughout the period covered the elementary education of the masses in England was controlled practically by the Established Church and the elected school boards. In the last decade included in the table (1893–1903) the board schools outstripped the church schools, even in respect to number of pupils. In 1893 they enrolled 41 per cent of the pupils, as against 44 per cent in the church schools; in 1903 the relations were reversed, board schools had run up to 49 per cent of the total enrollment, while church schools had fallen to 39 per cent. The British and Wesleyan schools were rapidly becoming a negligible factor in the problem, as they readily passed over to public control. The Roman Catholic schools, on the contrary, increased; but they represented a very small

TABLE I. — DISTRIBUTION OF SCHOOLS AND PUPILS AT SPECIFIED DATES

Classification of Schools	1873			1883.		
	Schools	Pupils		Schools	Pupils	
		Average attendance	Per cent of total		Enrolled	Per cent of total
National Society (Church of England)	8,051	1,017,688	68.64	11,703	2,134,719	49.95
Wesleyan	1,999	305,981	20.63	559	175,826	4.11
British and other schools (undenominational and Jewish)				1,412	337,531	7.89
Roman Catholic	524	88,828	5.99	817	226,567	5.30
Total voluntary	10,574	1,412,497	95.26	14,491	2,874,643	67.25
Board schools	520	69,983	4.74	4,049	1,398,661	32.75
Grand total	11,094	1,482,480	....	18,540	4,273,304	....

Classification of Schools	1893.			1903–4.		
	Schools	Pupils		Schools	Pupils	
		Enrolled	Per cent of total		Enrolled	Per cent of total
National Society (Church of England)	11,928	2,275,609	44.15	11,817	2,350,176	39.17
Wesleyan	522	173,885	3.37	450	153,523	2.55
British and other schools (undenominational and Jewish)	1,290	318,444	6.17	752	212,325	3.54
Roman Catholic	970	273,741	5.31	1,063	337,868	5.63
Total voluntary [1]	14,710	3,041,679	59.00	14,082	3,053,892	50.89
Board schools [2]	4,972	2,111,863	41.00	6,145	2,946,511	49.11
Grand total	19,682	5,153,542	....	20,227	6,000,403	....

[1] Since 1902, non-provided schools.

[2] Since 1902, provided or council schools.

TABLE II. — INCOME FROM GOVERNMENT GRANT AND LOCAL SOURCES

Classification of Schools	1873		1883	
	Government	Local	Government	Local
National Society (Church of England)	£549,426	£953,229	£1,203,025	£1,563,697
Wesleyan	164,298	285,925	101,124	119,443
British and other schools (undenominational and Jewish)			194,628	263,123
Roman Catholic	45,479	70,769	122,101	128,406
Total voluntary	759,203	1,309,923	1,620,878	2,074,669
Per cent of total	36.70	63.30	43.87	56.13
Board schools	12,868	84,051	771,950	1,362,284
Per cent of total	13.28	86.72	36.17	63.83
Grand total	772,071	1,393,974	2,392,828	3,436,953
Per cent of totals	35.65	64.35	41.05	58.95

Classification of Schools	1893		1902	
	Government	Local	Government	Local
National Society (Church of England)	£2,371,972	£973,241	£3,409,945	£962,205
Wesleyan	182,985	63,554	233,628	55,857
British and other schools (undenominational and Jewish)	343,660	158,000	394,987	153,023
Roman Catholic	277,610	101,822	464,163	99,385
Total voluntary	3,176,227	1,296,617	4,502,723	1,270,470
Per cent of total	71.02	28.98	78.00	22.00
Board schools	2,306,567	1,806,646	3,558,495	3,558,143
Per cent of total	56.08	43.92	50.01	49.99
Grand total	5,482,794	3,103,263	8,061,218	4,828,613
Per cent of totals	63.86	36.14	62.54	37.46

proportion of the total school provision, and they reached a particular class of the poor in crowded centers.

The government grant for schools, excluding grants for building and other permanent works, had reached in 1902 the princely sum of £8,000,000 ($40,000,000). The Church of England schools derived from this source 77 per cent of their income; in the different classes of voluntary schools the proportion ranged from 72 to 80 per cent, the remainder being made up from endowments, subscriptions, and fees. In the board schools, which absorbed 44 per cent of the grant, the income from this source was only 50 per cent of their entire income. The other 50 per cent, excepting a trifling amount, was derived from the rates.

Education Act of 1902. — This act of 1902 was the outcome of a political campaign which gave a sweeping victory to the Conservatives; but the problem with which it dealt had arisen from collisions within the system and pressure from without. The situation hinged upon a single fact, the phenomenal progress of the school boards; they had set a pace which the voluntary schools could not maintain; and by upward expansion their schools had come into rivalry with the older secondary schools.

The Strain of Voluntary Schools. — In 1896 the school boards were spending an average of $13 for the instruction of a pupil; voluntary schools spent $9, a difference of $4 per pupil. In the cities, the excess of the former ran up to $7 and $9 per capita. It was the difference between the steady resources of a public tax and the uncertain action of private benevolence, and was almost entirely represented by a lower payment of the teaching staff. At that time the school boards comprised 68 per cent of the population, concentrated chiefly in cities and towns. Besides the London board, dealing with a population of four and one quarter million, there were 170 school boards in county and municipal boroughs, comprising nine and one quarter million inhabitants. In this number were included Leeds, population (423,899), Liverpool (634,212), Manchester (543,902), Nottingham (239,384), Sheffield (361,169), West Ham (300,241). The school board system was admirably adapted to these great industrial communities, and could count upon their support. At the same time there were about 11,000 parishes without school boards, and of this number 8000 had only Church of England schools. It was, however, generally admitted that the rural parish area was too small for an efficient school board.

The obvious evils of this inequality were aggravated by the very natural antagonism of the Church to the extension of civil control in a province which, at a time not far remote, was exclusively its own. With the return of the Conservative party to power in 1895, this antagonism reached an acute stage, and the education problem assumed from that time the aspect of a partisan conflict. The Gorst Bill of 1896 was an unsuccessful effort to improve the situation. The following year a special aid grant for voluntary schools at the rate of 5*s.* per capita of average attendance was allowed. But this amount was entirely inadequate, and the action simply increased the general discontent.

The Higher Grade Board Schools. — The entrance of the board school into the province of secondary education introduced a new factor into a most intricate problem. This class of schools had arisen in response to demands created, in part, by the work of elementary schools, and, in part, by changing industrial conditions. They were confined, at least in their organized form, to the large cities, and were supported partly by local tax and partly by grants from the science and art department. They not only came into rivalry with secondary schools of the classical type, endowed, grammar, and private schools, but also with classes and schemes of technical education maintained by the county councils. The purpose of the government to interfere with the higher grade work of the school boards was foreshadowed by the withdrawal from elementary schools (1900) of the grants allowed by the Science and Art Department; the Cockerton judgment (*q.v.*) to the effect that school boards could not apply the income from local taxes for instruction in subjects other than elementary, and by a minute of the Board of Education (Apr. 6, 1900) fixing fifteen years as the upper age limit for pupils in higher elementary schools.

The difficulties of the situation were emphasized by the changes that had taken place in local government since 1870. City administration had been simplified by the Municipal Corporations Act of 1882; later, by the Local Government Act of 1899, the whole of England and Wales had been mapped out into sixty ✓ administrative counties and sixty-one county boroughs, having each more than 50,000 inhabitants, making, with the county of London (Greater London), 122 new administrative areas. The governing body in each area is a council formed, like the municipal councils, by popular election. But these measures, which simplified local administration as a whole, further complicated that of the schools. The councils had become education authorities through the control of the surplus liquor duties (Customs and Excise Act, 1890), which were generally used for the promotion of technical education. For the same purpose the councils were authorized to levy a tax (not exceeding a penny in the pound). Hence in the cities and towns there was friction and waste of resources between school boards and the technical education committees of the councils. Everywhere reform was demanded, larger areas for the administration of rural schools, a paramount authority for cities and towns.

The act of 1902 has therefore a double aspect: it was necessary on account of election pledges made by the Conservative party to their clerical adherents; at the same time it was intended to eliminate serious evils by equalizing and unifying the educational provision of the country. The latter aspect was the one presented by Mr. Balfour in submitting the measure to the House. " Its purpose," he said, was "to fulfill the pledge given in the King's speech that a bill should be introduced, dealing not with secondary education or with primary education in their isolation, but with both in one measure and with a view to their better coördination."

To this end, the bill swept out of existence the school boards, and transferred their functions to the county and borough councils. The single authority ideal was at once dissipated by the opposition of the great cities and the clamor of large urban districts. As a consequence boroughs having more than 20,000 inhabitants and urban districts having more than 10,000 were given independent control of their schools. The fear that the higher grade schools would be sacrificed was allayed by the duty imposed upon the councils to supply education other than elementary (Act 1902, Part II). In this connection, a concession was also made to the smaller cities and to urban areas by giving their councils " concurrent powers with the county councils in respect to the expenditure for higher grade schools " (Part II, clause 3). Finally, in view of the fact that the councils were already overtaxed, it was provided that they should delegate their powers under the law — excepting only the power of raising rates or borrowing money — to education committees (Part IV, sec. 17), while both councils and committees were relieved of the oversight of individual schools through the provision of school managers (Part III, sec. 6).

Thus to the councils designated as education authorities in the first clause of the law (in all, 129) were added 201 city councils, 853 authorities for " higher " education, and an indefinite number of education committees and school managers. The authority of the councils was not limited to the schools established by them, but extended equally to voluntary schools. By the original provisions of the bill the conduct of the latter was left wholly to their private managers; but the proposal to place denominational schools upon the rates without any degree of public control raised such a storm of opposition from both Conservatives and Liberals, that a slight but significant modification was made by which the local education authorities were allowed to appoint two out of six managers of voluntary schools; at the last moment the Kenyon-Slaney clause was carried, which placed the religious instruction under the control of these managers (Part III, secs. 6, 2; 7, 6). The managers of voluntary schools are further required in particular to carry out any direction of the local education authorities in respect to secular instruction, provide the schoolhouses free of charge, keep the buildings in good repair, and make such improvements in them as may reasonably be called for.

The constitution of the education committees was carefully provided for, and it was expressly ordered that women should be appointed upon them. This was a significant admission of the great service women had rendered as members of the school boards, although it failed to give them place in the really authoritative bodies, *i.e.* the councils, which was urged by progressive men and women all over the country. Henceforth the former board schools are to be known as public elementary schools provided by the local education authority (or, briefly, " provided " or council schools); the former voluntary schools, as non-provided.

It should be noted further that whereas the act of 1870 placed no restrictions upon the upward development of elementary schools, the present act is explicit on this point, and gives the first definition of elementary education in English law. It provides that: " In this act and in the elementary education acts the expression ' elementary school ' shall not include any school carried on as an evening school under the regulations of the board of education. The power to provide instruction under the elementary education acts, 1870 to 1900, shall, except where those acts expressly provide to the contrary, be limited to the provision in a public elementary school of instruction given under the regulations of the board of education to scholars who, at the close of the school year, will not be more than sixteen years of age: *Provided*, That the local education authority may, with the consent of the board of education, extend those limits in the case of any such school if no suitable higher education is available within a reasonable distance of the school. The power to supply or aid the supply of education other than elementary includes a power to train teachers, and to supply or aid the supply of any education, except where that education is given at a public elementary school " (Part IV, clause 22).

The act of 1902 went into effect Mar. 26, 1903, and in August of the same year a similar act was passed for London, which had not been included in the general measure. In the new era thus opened, elementary education, while retaining its separate aims, has become part of a more comprehensive system. This change was foreshadowed by the act of 1899, creating the Board of Education; and would have been impossible, if the local school boards, the " *ad hoc* bodies," to quote a popular term, had not been replaced by the councils which are charged with the whole range of local affairs. The unity of local administration has, however, introduced new elements of discord. The opposition to the act of 1902, roused by the overthrow of the urban school boards, by the restrictions upon municipal authorities, and the appropriation of local taxes to sectarian schools, has never ceased. " Passive resistance," the refusal of the Welsh councils to enforce the act, the coercive measures of the government, have all become matters of history. It is admitted that the present stage of the system is temporary; nevertheless, it is a stage in a progressive movement determined by three forces: the Board of Education, the local authorities, and the advancing ideal of public education. Although simultaneous in their action, these agencies may, for convenience, be separately considered; and, first, with regard to elementary education alone.

Board of Education. — The directive and unifying influence of the central board is accomplished by the service of inspection, by the annual codes, by reports of special inquiries, and by instructions issued from time to time on subjects of timely interest or pressing importance. The whole scheme of elementary education has been rearranged, the annual grants are now paid on a system which distinguishes between pupils on an age basis, the age of five years, the lower limit of compulsory education being taken as the line of division between infant schools or departments and those for older scholars.

Higher elementary schools must be organized to give a three-year course of instruction approved by the Board of Education, and must be specially equipped for the course. Admission to schools of this grade is limited to pupils who are over twelve years of age at the date of admission, and have been for at least two years under instruction in a public elementary school. The number of pupils habitually taught in a class must not exceed forty, and there must be a teacher for every class.

The most important measures adopted by the Board of Education for the improvement of elementary schools relate to the teaching staff and the school premises. The new requirements have reduced the " staff value," that is, the maximum number of scholars to one teacher of a specified class, by an average of about 20 per cent. Each school staff must include at least one certificated teacher for every eighty pupils in average attendance, and no class should exceed sixty registered pupils. As regards school premises, measures have been taken to insure that in all new schools there shall be not less than ten square feet of floor space for each older child, and nine square feet for each infant. At the same time the board inspectors, with the coöperation of the local authorities, have made a comprehensive review of all cases in which school premises are defective or unsuitable, and with this knowledge the necessary changes can be insisted upon. In every case, the plans for new school buildings, and for the alteration or enlargement of old buildings must be approved by the department in order that the schools should be recognized for grants.

Grants. — While the tendency is to raise the standard in respect to all the conditions required for the government grant, the basis of allotment has been simplified. The grants for elementary schools are at present as follows: The *annual grant*, allowed at the rate of 13*s.* 4*d.* for each unit of average attendance of children under five years of age; at the rate of 21*s.* 4*d.* for each unit above that age. An *aid grant*, which takes the place of the special grant for voluntary schools provided by the act of 1897. This aid grant is at the rate of 4*s.* per pupil, with an additional 3*d.* in areas where the product of the school tax is less than a specified minimum. The *fee grant* (law of 1891); *special grants* for areas having small populations. *Grants for special subjects* are allowed upon certain conditions pertaining to the age of pupils, the number in attendance, and the equipment of the school for effective instruction. The subjects classed under this head are: cookery, laundry work, housewifery, combined domestic subjects, dairy work, handicraft, light woodwork, and gardening.

Schools organized as higher elementary schools in addition to the aid grant and the fee grant have the following: —

For each Unit of Average Attendance of Scholars in the	Amount
First-year course	30*s.*
Second-year course	45*s.*
Third-year course	60*s.*
Fourth-year course (when sanctioned)	60*s.*

Evening schools, which had been well organized under the great urban school boards, are now included under secondary education.

Recent Changes in the Board. — To meet the enlarged ideals of popular education, the central board has made important changes in its own organization. Among these should be mentioned first the establishment of a medical department " to advise and assist the board in carrying out their statutory duties in this regard; in giving direction as to the frequency and method of medical inspection (*q.v.*), and in considering and sanctioning such arrangements as may be proposed under the act by the individual authorities." Second, the consultative committee has been increased from eighteen to twenty-one members, care having been taken to fill the new places and the vacancies caused by resignations with persons representing various aspects of education that have hitherto had no direct representation in the committee.

In accordance also with the determined purpose of the Welsh councils and people, as embodied in the lost bill of 1906 (Part III), the board established in the following year a special department for the administration of education in Wales, under the control of a permanent secretary and a chief department inspector, each responsible directly to the president of the board. This arrangement applies also to Monmouthshire, England, which was included in the previous Intermediate Education Act for Wales. In consequence of this distinct administration, the Welsh schools are now treated on an independent basis.

Local Authorities. — The difficulty in the way of focusing attention upon the details of the educational work arises from the number of local authorities upon which the execution of the education act depends, and which, within the limits of the law, have large independence. These authorities number at present 328, including 62 county councils, 74 county boroughs, 137 autonomous municipal boroughs, 54 urban districts, and the Isles of Scilly. The transfer of authority from the former school boards to the county and borough councils, and the formation of education committees, as required by the act of 1902, were accomplished with very little delay or friction, and the committees generally entered upon their duties with great energy. The chief advantage of the change, elementary schools alone considered, appears in rural districts. The power of grouping schools under one body of managers, accorded to the local authorities, has resulted in several counties in converting isolated schools into units of a county system. Further, when regarded as parts of the county system, different classes of schools, provided, non-provided, elementary, and higher elementary, are better coördinated, and can more readily be adjusted to local needs. Experience has shown, however, that while the county is a desirable area for some purposes, local interest in school matters has declined by the sacrifice of direct popular election of the controlling authorities.

The prevailing opinion on this subject was voiced in a resolution unanimously adopted by the National Education Association (England) as follows: "That in view of the acknowledged need to secure greater local interest and real popular control in educational affairs we consider that reforms in the system of local administration are urgently needed, especially in the direction of securing the direct popular election of local authorities having only educational duties to perform." It may be recalled here that the defeated bill of 1906 provided for reform in this respect by a clause which received the assent of both houses.

The distribution of pupils under the different classes of local authorities for the last year reported was as follows: Counties, 2,439,907; London, 748,262; county boroughs, 1,820,240; boroughs of 20,000 or more inhabitants and urban districts of 10,000 or more, 1,067,559. Thus it appears that of the total enrollment, viz. 6,075,968, there were 3,636,061 pupils, or 59 per cent, in urban schools.

Prior to the passage of the act of 1902, areas having no school board did not levy a rate for education (school tax). By that act the rate is universalized. It is estimated that of the entire ratable value of England and Wales, £186,500,000, fully sixty millions were thus brought, for the first time, under compulsory contribution toward elementary education. The local rate ranges from a minimum of *3d.* in the pound to a shilling and upwards. The act of 1902 restored, also, the principle of proportioning the grant for schools to the amount provided locally.

The independence of local authorities is illustrated by the recent action of the London County Council in withdrawing the twenty-two schools recognized as higher elementary from the grant list of that grade, in order that they might be perfectly free to develop these schools according to their local demands untrammeled by official rules. Experiments in vocational education have been begun in several of these schools since this course was adopted.

The number of local authorities seeking the sanction of the Board of Education in 1909 for providing meals to school children from the rates was 56. The number of authorities reporting medical inspection officers was 307 out of the total of 328. These areas included for England 45 counties, 66 county boroughs, 132 municipal boroughs, 42 urban districts; for Wales, 6 counties, 4 county boroughs, 4 municipal boroughs, and 8 urban districts.

The Advancing Ideal of Public Education.— The work of the local education authorities has been vastly increased by the extended scope of the system. The scholastic extensions provided for by the act of 1902 will be considered presently; more intimately related to the elementary schools is the social welfare work which centers in them or seeks their coöperation. Among many causes of the latter development, not the least is the thorough knowledge of the child population acquired originally by the school boards and necessarily maintained by the present authorities. Even the system of payment-upon-results had this to commend it, that it called attention to the evils of under-feeding, home toil, confusion, and misery, which often made it impossible for a child to meet any requirement. Varying forms of assistance were started under these conditions, for which legal provision has recently been made, placing a large degree of responsibility upon the education authorities.

By the Education (Provision of Meals) Act of 1906, the councils were authorized to incur expenses and adopt plans for supplying meals to children attending public elementary schools. (See FOOD AND FEEDING OF SCHOOL CHILDREN.)

The Administrative Provisions Act of 1907 authorizes local councils to maintain "for children attending a public elementary school, vacation schools, vacation classes, play centers, or other means of recreation during their holidays or at such other times as the local education authority may prescribe, in the schoolhouse or in some other suitable place in the vicinity, so far as the local education authority, in the case of a schoolhouse or place not belonging to them, can obtain for the purpose the use of the schoolhouse or place. The law also makes it the duty of the local authorities 'to provide for the medical inspection of children immediately before or at the time of, or as soon as possible after their admission to a public elementary school, and on such other occasions as the Board of Education direct,' and 'to make such arrangements as may be sanctioned by the Board of Education for attending to the health and physical condition of the children educated in public elementary schools.' "

The Children Act of 1908, though not strictly educational, increased the duties of the local education authorities, especially as regards school attendance and children remanded to an industrial reformatory or to a day industrial school. More and more, also, social welfare work tends to center in the schools. Aftercare committees and juvenile employment bureaus are in the process of becoming regular adjuncts of the city systems, regulated by law and entailing a vast amount of work and expense. This extension adds greatly to the current expenditures for the schools, but Treasury grants are not increased proportionately, and the burden falls heavily upon the local rates. (See Childhood, Legislation for the Conservation and Protection of.)

The child welfare movement is inseparable from the greatest educational problem of the present time, namely, the problem of continuation education, or the means of prolonging the education of the industrial classes beyond the ordinary school period, and of rendering this continued training vitally effective. The importance of this subject has been recognized on the part of the Board of Education by its reference to the consultative committee, who made an exhaustive investigation of the question in all its bearings. The burden of the committee's report is the incompleteness of elementary education, and the "tragic waste" of early promise. The waste is attributed largely to the lack of training which prepares, at once, for useful industry and for harmonious relation to organized society. The committee estimated that there were 2,000,000 boys and girls in England and Wales between the ages of fourteen and seventeen, of whom 75 per cent were receiving on week days, at least, no school education, and who were spending the time in idleness or in mere makeshift employments. Although convinced that the time has not yet come when compulsory attendance at continuation schools can be enforced throughout the country, the committee were unanimous in the opinion that the extension of the period of formal training is essential for national, as well as for individual, welfare. See Industrial Education; Continuation Schools; Evening Schools.

The immediate outcome of the investigation is a more intelligent comprehension of the problem, with, here and there, practical attempts at its solution. Most significant of these attempts are the measures taken by great industrial firms to induce their young employees to continue their education. Several instances are reported of firms that allow time for the purpose without loss of wages and with the prospect of advance and larger remuneration by reason of increased competency. (See Apprenticeship and Education.) On their part, the municipal councils are encouraging continued attendance at evening schools and at the higher elementary schools by scholarship funds, many of which, in addition to free tuition, give financial aid to the recipient.

The most impressive evidence of the advance in public opinion as to the value of education is afforded by the strong opposition to the continuance of the half-time system. A School Attendance Bill was submitted to the House of Commons in 1908, providing that the minimum age for exemption from school attendance should be thirteen years. The relation of this measure to the general welfare of juvenile workers was clearly shown by its author, Lord Stanley of Alderley, in his speech moving the second reading. He pointed out that while the Education Act of 1902 empowered local authorities to make by-laws giving partial exemption from school attendance, from May to October, to children employed in agriculture, that provision had not been taken advantage of at all. Nearly all the half-time employment in the country of children over twelve years of age, according to Lord Stanley, "is in the textile districts," and outside those districts "there is practically no half-time." Even where it exists, the figures support the view "that it is not a necessary condition of industry, even in the textile trades." The bill was not carried to second reading, but an interdepartmental committee was appointed to inquire into and report upon the whole subject of exemption from school attendance, the conditions of child labor, and the practical effects of legislation restricting the employment of children. In connection with this bill, the action of the United Textile Workers' Association is significant. The leaders of this association assembled in conference, by a vote of 186 to 27, approved the raising of the age of half-time labor from twelve to thirteen years. This is a striking evidence of the change that has taken place in the minds of this class of workers. For thirty years they have steadily opposed the steps by which the age for half-time labor has been raised from eight to twelve years. The committee above referred to agreed in an unqualified condemnation of the half-time system, and recommended its speedy abolishment. The question is once more before Parliament, and a bill was presented in March, 1911, by Mr. Runciman, tending to raise the age of exemption from school attendance, and adding to it compulsory attendance at a continuation school. (See Part-Time School Attendance.)

Classification and Scope of Elementary Schools. — The ordinary elementary schools are classified as infant schools (for children under eight years of age, normal ages five to eight) and schools for older scholars (*i.e.* ages eight to fifteen). Prior to 1902 the annual codes presented the general program for each class of schools, and also schedules showing the part of the program to be covered by each "standard" or grade. In order to allow greater freedom to individual schools in this respect, the standard schedules have been omitted from the recent codes, but the instruction in every school must follow a definite syllabus which has official sanction. The codes not only comprise the general program of studies, but also give suggestive instructions as to methods and aims; from time to time, model programs are also issued by the Board, and even elaborate manuals pertaining to individual subjects.

As regards infant schools, the free development of body and mind and the formation of habits of obedience and attention are the ends to be attained. For the younger "infants" there are games, simple manual exercises, stories, and familiar talks with the teacher, and for the older "infants" (five to eight) short lessons, in which they are trained "to listen carefully, to speak clearly, to recite easy pieces, to reproduce simple stories and narratives, to cultivate their powers of observation, to do simple things with their hands, to begin to draw, to begin to read and write, to acquire an elementary knowledge of number, to practice suitable songs, and to sing simple musical intervals." Instruction in sewing and knitting may also be given, care being taken to avoid fine work and injury to the eyesight.

The program of the schools for older scholars comprises: English language, writing, arithmetic, drawing, including modeling, observation lessons and nature study, geography, history, singing, hygiene and physical training, and for girls domestic subjects. Instruction in morals is required, but may either be incidental and occasional, as opportunity arises in the ordinary routine of lessons, or may be given systematically and by a course of graded lessons. It is not expected that every one of these subjects should be taken by every class, but a school must make provision for them all. The three elementary studies form the nucleus of the work of each class, and are the only subjects required for the examination for certificates which exempt children from compulsory school attendance.

The government inspectors are required to examine for a certificate of proficiency any child over twelve years, or any child over eleven years of age who is to be employed in agriculture under any by-law of the school attendance acts, whether he be a scholar in the school or not, if the child's parent or guardian or the authority apply to have him examined for such a certificate. As a rule children are not presented in a lower standard than the fourth, and hence the examination schedule for the fourth and higher standards, as given below, may be taken as an index to the class programs in the standard subjects, around which the remaining subjects are arranged as suits the conditions of the respective schools.

Standards of Examination in the Elementary Subjects

	Standard IV (Age 11 Years)	Standard V (Age 12 Years)	Standard VII (Age 14 Years)
Reading . .	To read a passage from a reading book or history of England.	To read a passage from some standard or a reading book, or a history of England.	To read a passage from Shakespeare or Milton, or from some other standard author, or from a history of England.
Writing . .	Eight lines of poetry or prose, slowly read once, and then dictated. Copy books to be shown.	Writing from memory the substance of a short story read out twice; spelling, handwriting, and correct expression to be considered. Copy books to be shown.	A theme or letter. Composition, spelling, and handwriting to be considered. Notebooks and exercise books to be shown.
Arithmetic (Scheme A.)[1]	Compound rules (money) and reduction of common weights and measures. In the Table of Length only yards, feet, and inches will be required in this and in the Fifth Standard.	Practice, bills of parcels, and single rule of three by the method of unity. Addition and subtraction of proper fractions with denominators not exceeding 12. Common weights and measures.	Averages, percentages, and stocks.

The examination in arithmetic is conducted in accordance with a prescribed syllabus. Children who are presented in the seventh standard are examined in the whole of the syllabus, which extends through percentage and interest. Children presented in standards below the seventh take proportional parts of the syllabus. In the case of children as low as the third standard, the examination includes only the four elementary processes and examples in the use of weights and measures.

Special Subjects. — In addition to the obligatory subjects, extra grants are allowed for special subjects, which must be taught according to an approved syllabus, in premises properly equipped for the purpose, by teachers of approved competence, and to pupils over eleven years of age. These subjects include cookery, laundry work, housewifery, domestic subjects, dairy work, handicraft, and gardening. (See HOUSEHOLD ARTS.)

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[1] An alternative scheme B is given for arithmetic, which carries the work in each standard a little further than scheme A. Short exercises in mental arithmetic are given in every standard.

Higher Elementary Schools. — The higher elementary schools complete the course of instruction available for the majority of English children. To be recognized as *higher elementary,* a school must be necessary; must be organized to give a three-year course of instruction approved by the Board of Education, and as regards teaching staff, buildings, and equipment, must meet the official requirements. The course of instruction is intended to extend that of the ordinary public elementary school, and to provide for training of a vocational character, the latter to be determined by local needs. The general course must include the English language and literature, elementary mathematics, history and geography, drawing and manual work for boys and domestic subjects for girls.

The number of scholars in a higher elementary school should not exceed 350; and admission is limited to scholars who are over twelve years of age and who have been for at least two years under instruction in a public elementary school. Except by special agreement, scholars may not remain in a higher elementary school after completing the third year of the course, or for any portion of a school year at the close of which they will be more than sixteen years of age. The number habitually taught in a class must not exceed forty, and there must be a teacher for every class.

Schools fulfilling the required conditions are entitled to the following grants: —

For each unit of average attendance of scholars in the	Amounts
First Year Course	30s.
Second Year Course	45s.
Third Year Course	60s.
Fourth Year Course (when sanctioned)	60s.

The entire enrollment in the different classes of public elementary schools, for the latest year reported (1908–1909) was 6,060,110. Of this number 6.8 per cent were younger infants (*i.e.* below five years of age), 21.6 per cent were from five to seven years of age; 53.5 per cent were seven to twelve years. The number enrolled above twelve years of age was 1,097,842, or 18.1 per cent of the total. The enrollment in higher grade elementary schools complying with the official regulations was only 9720, or less than 1 per cent of the number above twelve years of age. Hence it appears that the development of this class of schools proceeds very slowly. It should be noted that the London County Council has withdrawn its higher elementary schools from the special grant list, and is conducting them under the regulations for ordinary elementary schools. This change, which reduces the number of pupils reported in the higher grade, was taken in order that the council might develop schools of this order according to local needs, unrestricted by official conditions.

Relations between Public Elementary Schools and Schools of Higher Order. — The official regulations declare it to be "an important though subsidiary object of the elementary schools to discover individual children who show promise of exceptional capacity, and to develop their special gifts (so far as this can be done without sacrificing the interests of the majority of the children), so that they may be qualified to pass at the proper age into secondary schools, and be able to derive the maximum of benefit from the education there offered them." The transfer of pupils from elementary to secondary schools should take place not later than the twelfth year of age; but an earlier age is encouraged by a grant paid on transferred pupils between the ages of ten and twelve years, equivalent to the grant allowed for pupils in the public elementary schools. The main grant in secondary schools, however, is paid in respect of pupils between the ages of twelve and eighteen years.

The early age of transfer is advised for both social and educational reasons. The latter may be readily understood by reference to the preparatory schools, a special class of private schools intended to prepare pupils for the endowed public and grammar schools. They number at the present time about 360, with an average enrollment of thirty-seven pupils each, of ages nine and one half to thirteen and one half. The headmasters of these select preparatory schools are generally graduates of Oxford or Cambridge, and former pupils of the endowed public schools, and hence they infuse into their schools the spirit and traditions of the older institutions. The pupils from the ordinary elementary schools have been under totally different influences, and it is difficult to assimilate them to the tone of the secondary school; at the same time they have followed a course of study differing essentially from that of the regular preparatory schools.

For children of ordinary ability who leave the elementary school at twelve or thirteen years of age, evening schools offer opportunity for continued training, and as these schools are classed under the head of higher education, there are two diverging roads leading upward from the elementary school, one to secondary and the other to continuation schools. These relations presuppose a degree of continuity in the elementary and advanced courses of study.

Secondary Schools. — The Education Act of 1902 provides that "the local education authority shall consider the educational needs of their area, and take such steps as seem to them desirable, after consultation with the Board of Education, to supply or aid the supply of education other than elementary and to promote the general coördination of all forms of education." (Part II, sec. 2, (1)). This provision brought the whole field of education lying between the elementary schools and the universities — that is, secondary schools and technical schools — within the province of the local education authorities, either for aid and supervision or as factors in the general scheme of coordination. As regards technical schools and classes, the relation had already been established; in respect to secondary schools it was a new departure. Hence, reference must here be made to previous measures leading directly to this result.

The British Schools Inquiry Commission appointed in 1867 classified the secondary schools of England as first grade, or schools which continue the education of scholars up to the age of eighteen years or more; second grade, schools which carry the education up to the sixteenth year of age; third grade, schools for pupils whose education ends at about fourteen years of age. This classification has ever since prevailed, not as a formal scheme, but as an underlying principle corresponding in the main to social conditions.

The first-grade secondary schools lie outside the pale of local direction, although by reason of their relation to the supervisory functions of the Board of Education, they are brought within the recent movement. This exclusive class comprises the famous public schools which were the subject of special investigation by Lord Clarendon's Commission of 1861. They include seven endowed boarding schools, namely: Winchester, founded in 1382; Eton, 1440; Shrewsbury, 1552; Westminster, 1560; Rugby, 1567; Harrow, 1571; and Charterhouse, 1611; and two endowed day schools of a local type,— St. Paul's, 1509, and Merchant Taylors', 1561, both in London. In respect to their patronage and their influence in forming the character of the leading men of the kingdom, these schools are justly regarded as national institutions. (See PUBLIC SCHOOLS.) The report of Lord Clarendon's Commission, issued in 1864, led to the passage of the Public Schools Act of 1868 dealing with the seven boarding schools named above. This act provided for the appointment by the schools of new governing bodies which were to make new statutes and regulations for their respective institutions, subject only to approval by the Privy Council. Apart from the required removal of certain narrowing restrictions, and the assent of the Privy Council to their schemes, the new governing bodies were left with a free hand. At that time these schools had an aggregate annual income of £65,000 ($325,000), and were attended by nearly 3000 students, the élite youth of the country.

In 1864 the British Schools Inquiry Commission (under Lord Taunton) was appointed to inquire into the condition of the remaining endowed schools, 820 in number, which had been established at different times through the long period of seven centuries. Included in the same inquiry were 122 proprietary schools, or schools maintained by stock companies. Of the endowed schools 572 were regarded as secondary. They numbered about 40,000 students, and had a net aggregate annual income of £183,066 ($915,333), with exhibitions of the annual value of £13,897 ($69,485). Private schools, sometimes termed private adventure schools, were also included in this investigation.

From the report of the British Schools Inquiry Commission it was evident that the country was alarmingly deficient in secondary schools for the middle and laboring classes. There were at least a hundred towns with a population of 5000 or more that had no endowed grammar school. London, whose population at the time was nearly 3,000,000, had only twenty-six endowed schools, with less than 3000 pupils. More than half the population of the city (1,726,989) were destitute of any endowment for secondary education. Not only was the supply of public secondary schools far below the demand, but those that existed were often badly managed, their resources wasted, and their influence meager. In particular the commissioners noted the dearth of day schools. The report of this commission led in 1869 to the passage of the Endowed Schools Act (*q.v.*), which has had important results in respect to the particular schools affected. It embodied, however, only a single one of the recommendations of the Commission, namely, that calling for a central authority to draft new schemes for the administration of the endowments. This duty was intrusted at first to three special commissioners; in 1874 it was transferred to the Charity Commission (constituted under law of 1853), and finally, in 1899, to the newly constituted Board of Education.

For several centuries the expression "national education" applied in England to the discipline and culture of the great public schools, rounded out and completed by Oxford and Cambridge. The endowed grammar schools followed the same classical course, and sent their quota of students to the universities. But a new era was ushered in by the Reform Bill of 1832. The commercial and industrial classes rose to power, and for the changed demands of public life a new order of training and schools, less exclusive and less expensive than the old endowed schools, were required. King's College School, opened in 1829, and University College School, 1833, both in London, were modern in their purposes, and this was still more pronounced in the case of the City of London School, created by Act of Parliament in 1843, upon the basis of a bequest made four centuries earlier (1442).

The movement thus begun spread rapidly to all the populous centers of England. Stock companies were formed in some instances for the maintenance of schools, and in other cases a corporate system was adopted whereby any one could purchase the right, for a certain sum, to send a boy to the school in question, at a reduced rate. Among these proprietary schools, as they are called, several can be named of scarcely less distinction than the famous nine. Such are: Cheltenham College (1841); Marlborough College, for the sons of clergymen (1843); Clifton College (1862); and Bath College (1876). They imitated the older schools in the principles of their education, and took their headmasters from them. Rugby was especially preferred by the founders of the new schools on account of its reputation, which was then at its height, thanks to the labors of Dr. Arnold (*q.v.*). Their plan of study differed from that of the older schools. Together with the ancient languages, provision was made for mathematics and natural sciences, history and modern languages in such a way that, together with the "classical side," a "modern side" was organized. The former prepared its students for the university, while the latter fitted them for official and commercial careers. As a rule proprietary schools tend to become, in time, either independent endowed schools or simply private schools. A certain amount of uniformity in secondary education, both for boys and girls, was secured by the numerous examining bodies which sprang up in the second half of the nineteenth century. (See EXAMINATIONS.)

A return made to the House of Commons in 1892 showed great progress in the provision for secondary education, as a result of the labors of the previous commissions. The income of educational endowments available for secondary education, exclusive of property of an incalculable value in the form of sites and buildings for schools, was reported as £697,132 ($3,485,660). Of 1262 distinct endowments, 668 were then being managed under schemes approved by the Charity Commission. Comparison with the earlier conditions showed that many new schools had been endowed or established by other forms of private initiative during the period. This was marked in respect to schools for girls, to which subject the report of the Taunton Commission had devoted a chapter. Within ten years endowments had been furnished for forty-five schools for girls, with provision for fifty to one hundred pupils each. The Girls' Public Day School Company (*q v.*), organized in 1873, extended its work so rapidly that in 1897 it had thirty-four schools, with 7150 pupils.

The Board of Education and Secondary Education. — The authority conferred upon the Board of Education to pass final judgment upon the revised schemes for endowed schools has already been referred to. It remains only to consider additional functions of the Board in respect to "higher education" growing out of the Education Act of 1902. These functions are exercised in practically the same way for all secondary and technical schools below the universities and the great public schools. Regulations are issued setting forth the conditions on which the Parliamentary grants may be obtained, and for schools meeting those conditions a service of inspection and examination is maintained by the Board, by means either of its own inspectors or of the agencies which it may recognize for the purpose (universities and other organizations).

In regard to technical schools and classes, this is a continuance of the work formerly carried on by the Science and Art Department; but in the case of secondary schools the relation is new, and is effecting radical changes in the spirit and purposes of secondary education in England. Secondary schools are free to accept or reject government aid and inspection, but if they accept, they must comply with the official requirements.

Conditions Pertaining to Grant-aided Secondary Schools. — The term "secondary" is applied by the Board to "any day or boarding school which offers to each of its scholars, up to and beyond the age of sixteen, a general education, physical, mental, and moral, given through a complete graded course of instruction of wider scope and more advanced degree than that given in elementary schools." The course of a secondary school is not considered to be complete unless it is planned to carry the scholars to such a point "as they may reasonably be expected to reach at the age of sixteen." It may begin at the age of eight or nine, or even earlier; scholars may pass into it from elementary schools at various ages beyond this, up to twelve or thirteen, and in schools of a high grade which give an education leading directly on to the universities, it may be continued up to the age, even, of eighteen or nineteen. As a rule, the years from twelve or thirteen up to sixteen or seventeen are those to which the official regulations are directed.

It is expressly required that a grant-aided school shall be efficient and shall not compete unduly with a neighboring school; that no religious test or requirement as to religious observances or attendance upon religious exercises shall be imposed upon day scholars; the curriculum and time-table of the school must be approved by the Board of Education; a full account of the income and expenditure of the school must be annually submitted to the Board; the fees charged, the school premises, equipments, and appliances must be satisfactory to the Board; and the school must be open at all times to inspection by the Board. It is further provided that the school shall meet regularly during not less than thirty-six weeks in the course of the school year, and for not less than four hours each school day; that the teaching staff shall be sufficient in number and qualifications; the salaries offered shall not be subject to variation according to the amount of grant received, and the registers must show not less than twenty qualified students above twelve years of age in the approved course of secondary education.

The obligatory subjects of the course are the English language and literature, at least one language other than English, geography, history, mathematics, science, and drawing. A curriculum including two languages other than English, but making no provision for instruction in Latin, will only be approved where the Board are satisfied that the omission of Latin is for the educational advantage of the school. The instruction in science must include practical work by the pupils.

Provision must be made in all the schools for organized games, physical exercises, manual instruction, and singing. Schools for girls must offer practical instruction in domestic subjects, such as needlework, cookery, laundry work, housekeeping, and household hygiene; for girls over fifteen years of age an approved course in a combination of these subjects may be substituted, partially or wholly, for science and for mathematics other than arithmetic

In all fee-charging schools free places must be offered at the beginning of the school year to pupils entering from public elementary schools under the conditions laid down in the regulations. The number to be offered will ordinarily be 25 per cent of the total number of pupils admitted to the school during the previous year, or, in the case of a new school, at its opening; but this percentage may be reduced or varied by the Board on sufficient grounds in the case of any particular school. (See SCHOLARSHIPS.) The governing body of a grant-aided school, where it is not the local education authority of a committee of the same, must contain a majority of persons representing a popular constituency.

Within the limits of these general conditions, different types of secondary schools are recognized as suited to the different requirements of the scholars, having regard " to their place in the social organization, to the means of the parents and the age at which the regular education of the scholars stops, as well as to their probable future occupations and opportunities."

To the secondary schools that meet the specified conditions, annual grants are paid, as follows: For each pupil between ten and twelve years of age, and who, for two years immediately before entering the secondary school, had atattended a public elementary school, £2 ($10).

For each pupil twelve to eighteen years of age, £5 ($25).

An additional grant at the rate of £1 ($5) for each pupil twelve to eighteen years of age in a school which provides: (1) for the preliminary education of elementary school teachers as bursars or in a pupil-teacher center forming an integral part of the school; and (2) has offered not less than 25 per cent of free places.

Extra grants are also made to schools receiving French or German assistants under plans arranged with the respective foreign governments. " These grants were given in the year 1908–1909 to two schools in respect of one ' assistant ' each, in the year 1909–1910 to twenty-two schools in respect of twenty-three 'assistants,' and in the year 1910–1911 they will be payable, if the prescribed conditions are duly fulfilled, to twenty-two schools in respect of twenty-five 'assistants,' three of the schools receiving both a French and a German 'assistant.' "

Special grants are also offered to schools that adopt methods of exceptional value in the conduct of particular branches of study or in the general management of the school. The experiments that meet the approval of the Board are set forth in detail in a series of educational pamphlets, of which two have already been issued: one relating to *The Teaching of Latin at the Perse School, Cambridge*, and the other to *A School Week in the Country*, an interesting experiment on the part of the girls' department of a secondary school in Bradford. According to the official report, "there is much more disposition in the case of the girls' schools than in schools for boys to favor experiments and give free play to fresh ideas. . . . The Board has increased the staff of women inspectors to assist in the successful and sympathetic handling of this side of their work."

As regards curriculum, the earlier efforts of the Board were directed mainly to scientific subjects, in which the schools were generally weak. At present, literary subjects are being emphasized, and thus the whole scheme of secondary studies is undergoing revision. There is also a noticeable disposition on the part of the Board to substitute intelligent inspection for the excessive strain of stated examinations.

Local Authorities and Secondary Education. — The Board of Education has become a unifying force in the entire field over which its authority extends, by virtue of the grants which it disburses, the standards which it maintains, and the model schemes and detailed instructions which it publishes; but the more important purpose of equalizing the educational provision of the country rests with the local education authorities. In this respect their powers are extensive. They may apply the proceeds of the liquor duties allowed them under the act of 1890 to this work, and may levy special taxes for higher schools. As a rule the local authorities have entered with energy upon these duties. In the chief boroughs and in all the larger counties, notably in London, Sheffield, Birmingham, Liverpool, and Manchester, and in the counties of Lancashire and Yorkshire, the whole field has been carefully surveyed under expert direction, and systematic plans formed for the improvement of existing schools and the establishment of new schools. In 1905 there were 122 secondary schools provided by the local authorities, not including Wales. In 1910, out of a total of 841 secondary schools on the grant list, 325 were maintained by the local authorities. These included schools originally provided by the local authorities, and former endowed or proprietary schools which have been transferred to them. The 516 remaining schools have popular representatives upon their governing boards, and are in many cases aided by local grants. Thus by a gradual process the old type of secondary schools is being absorbed, as it were, into the public system.

In addition to the secondary schools on the grant list there were eighty-seven schools recognized as efficient, making, with 109 schools in Wales, a total of 1037 secondary schools under government inspection. They registered 172,244 pupils (boys, 92,743; girls, 79,501). Of this total more than one fourth were on the free basis.

Coeducation. — Many rural districts are unable to support separate schools for boys and girls, and consequently adopt coeducation; the policy is spreading also to towns of considerable size. Of the 928 schools in England, recognized as efficient in 1909–1910, there were 150 in which boys and girls were taught together throughout the school, and 23 in which they were taught together in some classes.

In Wales, where the majority of the secondary schools are provided by the local authorities, out of a total of 109 schools on the grant list, 59 were coeducational, 25 were for boys only, and 25 for girls only.

Specialized Continuation Schools. — Evening schools are a link between the system of elementary education and specialized schools of science and art. Since the transfer of this entire work to the Board of Education, progress has been made in the organization of the varied forms of evening schools and classes, particularly in the more densely populated boroughs of the north of England, where the effort is supported by the pressing needs of the industrial situation. For detailed discussion of organization, see INDUSTRIAL EDUCATION, also EVENING SCHOOLS.

Technical Education.— This entire phase of English Education will be discussed in the article on INDUSTRIAL EDUCATION.

The Universities and the National System. — Higher education, in the sense of liberal, scientific, and professional education, is provided in England by universities, university colleges, and professional schools. The modern spirit, the product of liberal ideas of scientific knowledge and industrial demands, is reflected in this higher realm of intellectual activity, not less than in the more extended field of popular education.

In the older universities the process of adjustment to new ideals and demands can be traced from the beginning of the nineteenth century. Science gained special recognition in the middle of the century by the establishment of the Natural Science Tripos at Cambridge, 1851, and the Natural Science Honor School at Oxford, 1853. Notable among the events which mark the changing current of intellectual interests was the founding of a professorship of mechanism and applied mechanics at Cambridge in 1875; the first holder of the chair, Professor James Stuart, established workshops, which afterwards became the property of the university. In these shops practical instruction was given in pattern making, forging, turning, and fitting. About the same time an examination in mechanism and applied science was instituted as one of the special avenues to the ordinary B.A. degree.

The policy of assigning military commissions to university students gave great impulse to studies pertaining to military engineering, military topography, law, etc., and measures were at once taken by both Oxford and Cambridge to adapt the new military courses to the ordinary studies.

Of deeper significance are the movements which grew out of the new impulses in political and social life. The University of London, founded in 1836 as an examining body, was a protest against ecclesiastical monopoly of scholastic sanctions. Two decades later (1854–1857) religious conditions for the B.A. degree were eliminated at Oxford and Cambridge, and, in 1871, when the movement for popular education was at its height, the two universities were freed from all doctrinal tests.

The system of examinations for middle-class schools and individual pupils was the instinctive effort of the universities to extend their sphere of influence throughout the expanding circle of national intelligence. The effort culminated in the university extension movement (*q.v.*), which gave direction to the awakening aspirations of the workingmen of England, and prepared the way for the modern universities.

In the rising regard for education as a national panacea, the interests of women were not ignored. Bedford College for Women, founded in 1849, drew inspiration from London University, and later on, as a consequence of the system of examinations for schools and pupils, Oxford and Cambridge became the seats of colleges for women. In 1878 London University admitted women to its degrees, and in 1895 Durham University took similar action. The Cambridge University Tripos was formally opened to women in 1881, and the Oxford examinations in 1884, but degrees are not conferred upon women students by the two older institutions. (See WOMEN, HIGHER EDUCATION OF.)

The expansion of the university curriculum is not less marked than the widening sphere of university influence. In 1891 Oxford University instituted the degrees of Bachelor of Letters and Bachelor of Science, which were intended to promote and recognize modern studies and intensive research. A doctorate in letters and in science followed. Cambridge University also arranged to admit persons as advanced students and candidates, upon special conditions, for the degree of B.A., and in pursuance of an act of Parliament, 1903, for the regulations of mines, instituted a new diploma in mining engineering. At Oxford arrangements for special studies, leading up, not to a degree, but to a diploma, have increased; among the diplomas recently recognized are those in anthropology and in forestry.

The University of London, reconstituted by statutes of 1900, as a teaching university, is a federation of twenty-six colleges and schools giving instruction in eight faculties (arts, law, medicine, theology, science, engineering, economics, and music). The university maintains intimate relations with the municipal system of public education through the council scholarship scheme, which provides the means whereby promising pupils may rise from the elementary school to the full privileges of the higher education. By virtue of an annual subsidy from the council, the latter has the right to nominate a certain number of students to the constituent colleges of the university.

The most impressive fact in the recent history of higher education is the rise of university colleges in the great manufacturing centers. They are the outcome, in part, of private benefactions, and, in part, of municipal enterprise, and their development has been stimulated by Parliamentary grants, annually allowed since 1889. By the federation of the new colleges with older local institutions, scientific and technical, museums, libraries, etc., no less than six universities have been created, each having its distinct sphere of influence. These are Birmingham, Bristol, Leeds, Liverpool, Manchester, London, Sheffield; in addition these are the university colleges of Newcastle (Armstrong College), Nottingham, Reading, Southampton (Hastley College). These regional universities are all essentially modern in spirit and purpose ; they offer their facilities on liberal terms alike to men and women, and meet the wants of the artisan classes by their ample provision for evening instruction. They are, as a rule, admirably equipped for technical specialties, and they have, from the first, made unequaled provision for the training of teachers in both the theory and art of their profession. While science and technology were the subjects of the earliest interest with these institutions, they include in their curricula a fair proportion of classical studies, and thus serve to unite scholastic traditions with modern interests.

The realization on the part of these modern universities of their " joint responsibility to the national life," is indicated by the steps they have taken for the common recognition of their various matriculation examinations. The northern universities of Manchester, Liverpool, Leeds, and Sheffield (*qq.v.*) have, under their charters, established a joint board which conducts a single examination of all candidates for admission to any one of the four, and seeks to further the movement " for a regular interchange of views, and for the better organization of facilities for advanced study throughout the Empire." (See Table 6, p. 480.)

The importance of the universities, in the increasing scope of public education and of national responsibility in the matter, is recognized by the recent establishment of the Universities Branch of the Board of Education. In respect to this special division it is officially stated: " that the technological and professional instruction (including the training of teachers for elementary and secondary schools) given by the universities and aided by grants from the Board could not be properly dealt with as part of the ordinary administration of the Board as applied to institutions which have less autonomy, responsibility, and prestige than the universities. The universities need the greatest possible degree of freedom in organizing and carrying out their important national and international functions." In accordance with these convictions, the new division was organized (April, 1910), with Dr. H. F. Heath, Director of Special Inquiries and Reports, as the responsible chief.

By its schemes of scholarship the Board of Education maintains also an open road from the technical and art schools to the Imperial College of Science. This institution is a group of associated colleges, comprising among others the National School of Mines and Normal School of Science (South Kensington) and the City and Guilds Institute. The imperial college was incorporated by Royal Charter in 1907, and was admitted as a school of London University in 1908, but its national character is preserved by the administration of the government scholarships, which draw to this center select students from every part of the kingdom. The Board has recently established special scholarhips for teachers of science and technology, who are qualified to enter on the third or fourth year of the course provided at the Imperial College. Thus this central institution will furnish standards and methods for the teaching of these special subjects throughout the kingdom.

Statistical Summaries.— The following tables show the scope of the expanded system of public education as presented in the latest official report: —

Table 1. — Schools and Pupils under the Board of Education — England and Wales.

Class of Schools	1907–8		1908–9	
	Schools	Enrollment	Schools	Enrollment
Elementary education:				
Public elementary schools	20,621	5,984,130	20,699	6,025,163
Certified efficient schools	75	4,988	77	5,153
Special schools —				
For the mentally or physically defective	190	13,247	215	14,682
For the deaf . . .	47	3,421	48	3,468
For the blind . .	39	1,642	39	1,659
For epileptics . .	5	216	5	265
Poor Law schools .	66	15,470	66	15,470
Higher elementary schools	38	8,718	44	9,720
Higher education:				
Evening schools, etc., for further education	6,874	751,600	7,153	752,356
Secondary schools . .	840	81,719	912	148,794
Training colleges . . .	79	10,492	83	11,372
Technical instruction:				
Technical institutions	37	2,863	42	3,400
Day technical classes .	97	9,029	103	10,277
Schools of art . . .	225	41,723	225	42,112
Art classes	40	2,493	46	3,060
Total	29,273	6,931,751	29,757	7,046,901

Public Elementary Schools. — The public elementary schools included in the foregoing table had an enrollment of 6,025,163 (3,041,699 boys; 2,983,464 girls) pupils, equivalent to 17 per cent of the population; they maintained an average attendance of 5,344,704, or 88.7 per cent of the enrollment. The schools referred to are classified as follows: council schools, corresponding to the former board schools, average attendance, 3,038,204; voluntary schools, which now share in the local taxes, average attendance 2,306,500.

Teaching Body. — The teaching force of the elementary schools was as follows: —

TABLE 2. — NUMBER OF ADULT TEACHERS, ENGLAND AND WALES, 1908–1909.

CLASS OF TEACHERS	MEN	WOMEN	TOTAL
Certificated:			
Trained	22,640	28,035	50,675
Untrained	9,386	34,712	44,098
Uncertificated	5,668	38,714	44,382
Others	877	19,154	20,031
Total	38,571	120,615	159,186

Apart from the requirement that the head teacher of a school shall be certificated, the appointment of teachers, their salaries and tenure of office depend entirely upon the local authorities; in these respects there is as wide a range of difference as in the United States. The average annual salaries, in English schools, according to the estimates for 1908–1909, were as follows:—

CLASS	SALARIES			
	Men		Women	
Head teachers, certificated:				
Higher elementary schools .	£348	$1691	$215	$1045
Ordinary elementary schools	173	867	120	587
Certificated assistants:				
Higher elementary . . .	161	782	111	539
Ordinary elementary . . .	124	604	90	437

For uncertificated teachers the average salaries range for men from £43 to £89 ($215 to $445); for women, from £36 to £66 ($180 to $330).

TABLE 3. — TRAINING COLLEGES FOR TEACHERS, ENGLAND AND WALES, 1908–1909.

CONTROLLING AUTHORITY	COLLEGES	STUDENTS		TOTAL
		Men	Women	
Local education authorities . . .	15	446	2062	2,508
Universities or university colleges	20	1499	1592	3,091
Voluntary (chiefly denominational):	48	1636	4103	5,739
Total	83	3581	7757	11,338

The training colleges are supported by private funds, local appropriations, and government grants. The grant in respect of resident students is at the rate of £53 a year for men and £38 for women.

Cost of Education. — The sources of income for elementary schools for 1908–1909 and the amount from each source as reported by the local authorities in charge of education are summarized in the following table: —

TABLE 4. — RECEIPTS BY LOCAL AUTHORITIES FOR YEAR ENDING MARCH 31, 1909, FOR CURRENT EXPENSES.

	ELEMENTARY EDUCATION		HIGHER EDUCATION	
		United States Equivalent		United States Equivalent
Residue grants			£829,159	$4,029,712
Parliamentary grants . .	£11,329,380	$55,060,786	1,063,628	5,169,232
Rates and borough funds .	11,162,515	54,249,822	1,768,444	8,594,637
Receipts from local authorities	93,214	453,020	197,277	958,766
Fees and sale of books and other articles	143,006	695,009	417,135	2,027,276
Endowments . Other receipts .	217,182	1,055,504	199,336	968,772
Total receipts .	22,945,303	111,514,172	4,474,983	21,748,417

The relative proportion of the total receipts derived from the chief contributing sources was as follows: —

	ELEMENTARY EDUCATION PER CENT	HIGHER EDUCATION PER CENT
Parliamentary grants	49.3	42.3[1]
Rates and borough funds and receipts from other local sources .	49.0	44.
Fees and sale of books	0.6	9.3
Endowments and miscellaneous .	1.1	4.4

The total payments in respect of elementary education made by the local authorities, England and Wales, for the year ending Mar. 31, 1909, amounted to £22,795,178, which was £150,125 less than the receipts for that purpose.

The distribution of payments among the different types of local authorities, so far as analyzed, was as follows: —

TABLE 5. — EXPENDITURE FOR ELEMENTARY EDUCATION CLASSIFIED BY LOCAL AUTHORITIES.

TYPE OF AREA OF LOCAL EDUCATION AUTHORITY FOR ELEMENTARY EDUCATION	AMOUNT	
		United States Equivalent
Administrative Counties:		
(*a*) Areas under County Councils .	£7,861,361	$38,206,214
(*b*) Boroughs	2,127,419	10,339,256
(*c*) Urban districts	1,642,944	7,985,707
Total of above	11,631,724	56,530,178
London	4,368,857	21,232,645
County boroughs	6,776,490	32,933,741

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[1] Includes residue grants from the liquor duties.

Table 6. — Analysis of Returns of Students under Instruction in Grant-Aided Universities and University Colleges, 1908–09.

Name of university or college	Students preparing for matriculation.	Students preparing for degree courses (over 300 hours).	Degree courses of less than 300 hours. [Law students in brackets.]	Research for post-graduate students.	Students in training to be teachers.	Whole-time students, i.e. over 300 hours.	Part-time students, i.e. under 300 hours. [Evening students in brackets.]	Total number.		Other students taking special courses of lectures, e.g. teachers, etc.
								Day.	Evening.	
England										
Universities:										
Birmingham	19	455	18	72	245	756	228	984	—	—
Bristol	21	125	—	19	241	442	413 [287]	568	287	501
Leeds	10	370	55 [12]	54	134	657	508 [233]	932	233	64
Liverpool	—	617	—	112	230	997	147	1,144	—	—
Manchester	48	794	165 [38]	175	252	1,167	618 [199]	1,586	199	400
Sheffield	21	133	18 [6]	31	59	255	1,634 [1,390]	499	1,390	297
London:										
University College	—	519	—	308	80	1,225	250 [27]	1,448	27	2,500 [372]
King's College	—	520	—	126	108	1,040	732 [381]	1,391	381	800 [705]
Bedford College	19	172	—	28	53	229	128	357	—	—
School of Economics	—	175	—	96	—	274	1,003	274	1,003	—
University Colleges:										
Newcastle: Armstrong College	—	248	—	9	204	407	999 [781]	625	781	—
Nottingham	18	211	14	5	150	377	1,986 [1,737]	626	1,737	—
Reading	1	90	8	13	113	345	888 [625]	608	625	—
Southampton: Hartley College	10	73	15	4	148	210	498 [484]	224	484	—
Total	167	4,502	293	1,052	2,017	8,381	10,032	11,266	7,147	5,639
Wales										
University Colleges:[1]										
Aberystwyth	20	439	—	13	144	481	92	573	—	128
Bangor	—	273	—	7	110	293	37	330	—	—
Cardiff	—	463	—	25	191	543	66	609		398
Total	20	1,175	—	45	445	1,317	195	1,512	—	526

[1] Constituent colleges of the University of Wales.

Grant-aided Universities and University Colleges, England and Wales. — The above table pertains to the institutions to which the Board of Education disburses the annual parliamentary grant, amounting at present to £100,000 ($500,000) for "university colleges in Great Britain," and three colleges in Wales, to each of which an annual grant of £4000 ($20,000) is made.

The total expenditure for the English institutions in the foregoing table in 1909 was £530,267 ($2,651,335). Of this amount 26.6 per cent was borne by the government grants; 16.3 per cent by local appropriations; 14.9 per cent by endowments; 32.3 per cent by fees. The corresponding particulars for the three colleges in Wales are: total expenditures, £51,626 ($258,130), borne as follows: government grant, 39.4 per cent; local appropriations, 8.1 per cent; endowments, 7.7 per cent; fees, 3.9 per cent. The small balance, 11.9 per cent, was derived from other local sources.

Table 7. — Government Grant, Education, Science and Art for 1911–1912.

Service	1911–1912	
England and Wales		United States Equivalent
Board of Education	£14,375,442	$69,864,648
British Museum	183,271	890,697
National Gallery	18,994	92,310
National Portrait Gallery	5,738	27,886
Wallace Collection	6,523	31,701
Scientific investigations, etc.	61,603	299,390
Universities and Colleges	276,500	1,343,790
Intermediate education (Wales only)	27,300	132,678
Total	14,955,371	72,683,100

Present Outlook. — Public education in England, that is, education aided and directed by the State, has been a process of growth fostered by all the forces, religious, social, and political, that have gone to the making of the national life. The Education Act of 1902 embodies the federation principle that marks the present era, and has brought about the realization of this principle in every order of education, from the elementary school to the university. This is doubtless an effect which will be carried on through subsequent changes of law and purpose as part of the precious heritage of the past. What the next stage in the process will be, so far as it relates to elementary schools, is plainly indicated by the most important event pertaining to them that has taken place since 1902. The opposition to the act of that year culminated in the Education Bill of 1906, submitted by the Liberals and carried by a large majority through the House of Commons. The first clause of the bill provided that: " On and after the first day of January, one thousand nine hundred and eight, a school shall not be recognized as a public elementary school unless it is a school provided by the local education authority." In other words, the bill swept away the dual system of public and church schools, and placed all on the common basis of public control and public support. It was in respect to this clause that the bill was wrecked in the House of Lords. The larger question of the rights of the Commons and the restriction of the authority of the Upper House, now pending, carries with it, by common admission, the resettlement of the education question on the basis of the defeated bill. Practically all the other important provisions of that measure have been secured either by the subsequent acts already referred to, or by orders of the Board of Education, as in the case of the separate administration for Wales.

It is a significant fact that, while the bill of 1906 refused to recognize church schools, it made ample provision for religious instruction in the schools, and even for sectarian teaching under due safeguards. The debate over the measure proved that England was not prepared at that time for a system of education purely secular; but at the same time the opposition to government support for denominational teaching was intense. So far as possible, the will of the Commons in this respect has been carried out by subsequent regulations of the Board of Education. They have opened secondary schools to aspiring students, irrespective of their religious tenets, and they have required that in every training college at least half the number of vacant places in each year shall be filled under the same conditions. The result is that, in addition to the 7000 places in undenominational colleges, half of the 5000 places in denominational colleges are at present free from religious tests. These provisions illustrate the spirit of compromise which has marked the gradual progress of popular government in England. Never before in that long history were the democratic forces so strong and so well organized as at the present time; the Education Bill of 1906 embodied their mandate with respect to public education, softened by regard for all the precious inheritance from the past. In this particular the author of the bill, Rt. Hon. Augustine Birrell, at that time President of the Board of Education, was more conservative than the party which he represented. The unswerving adherence of that party to the principle of civic control was emphasized by the McKenna Bill, submitted to the House of Commons Feb. 24, 1908, but speedily withdrawn in view of the certainty of disagreement between the two Houses. The same course was taken with a substitute measure introduced later in the year (Nov. 20) by Mr. Runciman, who had succeeded Mr. McKenna as President of the Board of Education. Subsequent events have deferred Parliamentary action in this matter; but meanwhile, as a result of the united efforts of Mr. Runciman and the Archbishop of Canterbury, supported by eminent men and women of both parties, a committee has been formed for the purpose of devising a plan for " resettlement in English elementary education." This committee concedes the principle of public control for public schools, and of absolute religious freedom for the teachers. Their plan provides, however, for local option in respect to the continuance and support of denominational schools according to the choice of parents.

Notwithstanding, therefore, the increasing unity of educational aims, the common recognition of urgent problems of continuative education, of vocational training, of rural education, the paramount question in regard to this interest in England is still that of the local administration and support of elementary schools. Second only in importance to this interest is that of the authority of the Board of Education, which has been steadily increasing since its creation in 1899. This authority, however, bears no resemblance to the absolute dictum of a centralized authority like the French Ministry of Public Instruction. It rests upon the voluntary assent of civic or institutional authorities, desirous of sharing in the treasury grants or of promoting unity of aim and economy of resources through a national agency. All government measures are closely scrutinized by local authorities intolerant of any encroachments upon their rights, and are subjects of keen analysis and criticism by the numerous educational associations for which England is noted. Apart from their mastery of professional problems, these associations exercise great influence either by their political affiliations, as in the case of the National Union of Elementary Teachers, or their social affiliations, as in the case of the Association of Headmasters, or by their effective organization of popular opinion, as illustrated by the North of England Education Conference.

The education system, like the national life of England, not only progresses by compromise, but holds to what is enduring by a marvelous system of checks and counterchecks.

A. T. S.

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ENGINEERING.—See Technical Education.

ENGLISH COLLEGES. — See Colleges, English.

ENGLISH GRAMMAR. — See Grammar, English.

ENGLISH LANGUAGE AND LITERATURE. — This subject is treated in its various aspects under the appropriate captions. The principles underlying the development and present structure of languages in general and of the English language in particular, together with the essential facts in its historic development, are given under Philology, and Language, English. A further treatment of historic aspect of the topic will be found under Anglo-Saxon. Under the title Grammar, English, will be found a statement of the history of the scientific or logical study of language structure and usage, especially as it has affected the schools. The question of usage is further treated in regard to underlying principles in the following article on English Usage. Educational practices and conditions relating to training in usage are presented in the article on Composition; the academic relations of English are dealt with under the title Literature, English. Related to certain aspects of the subject are the special articles on Literature, Children's, and Literature, Comparative. The problems relating to the teaching of English in American secondary schools are stated in the article on College Requirements for Admission. Various topics relating to method are treated more fully under the caption, Reading, Teaching of, and under the various special topics relating to method. The place of English language and literature in foreign schools will be considered under the caption Modern Languages in Education, and also, so far as the place in the curriculum is concerned, in the articles on the educational systems of the various countries. Appropriate lists of references to the literature of the subject are given in connection with each of the articles mentioned.

ENGLISH LANGUAGE, TEACHING OF. — See Composition; English Grammar.

ENGLISH LITERATURE IN THE SCHOOLS. — See Literature, English.

ENGLISH METHOD IN READING. — A special system for teaching beginners to read, considerably used in England during the last quarter century. It was embodied in a set of three small volumes issued by Messrs. Meiklejohn and Sonnenschein. The main idea of this special arrangement of reading rests upon a classification of the reading words to be used by children into two groups : (1) those words with a regular spelling where each letter has a single value or function, and (2) those in which the symbol may stand for several sounds, or in which several symbols may represent a single sound. All the earlier reading work is to be confined to a use of material of the first class. Only after considerable acquisition of reading power would the child be brought into contact with anomalous spellings. H. S.

See Reading, Teaching of.

ENGLISH SPELLING. — See Spelling.

ENGLISH USAGE. —Questions of usage are the most persistent, and generally the least satisfactorily answered, of all that arise in the practical study and teaching of language. They occur in connection with all the various aspects of language, but whether the question is one of concord or morphology in grammar, of the quality of a sound or of an accent in pronunciation, or of the spelling of a word in writing, the same general principles are involved. All those aspects of language which tend to become systematic and formal inevitably give rise to questions of usage. Much of the uncertainty in answering these questions is due to a lack of clear distinction between two different ways of regarding language, the one being concerned with the manner in which system or regularity develops in speech, the other with the value and consequently the justification of deviations, or apparent deviations, from the regular.

It is obvious that use or custom is the most powerful influence in bringing about system and regularity in speech. No external authority has the power to impose a system of grammar upon a language which practical use merely exhibits in daily conversation and writing. Nor again is there any ground for supposing a kind of inherent organic nature in a language which develops, or evolves itself, through the medium of actual practice. Speech grows, as social custom grows in other ways, through the tendency of human beings to imitate each other and to become alike in their social acts, and thus to unite themselves in groups. Regarded in this way, the usage of a language may be defined as the customary practice of a given group of people with respect to the social activity of speech. This is manifestly a broad definition, and covers all the activities of language, but it is only by looking at the matter from this comprehensive point of view that a sound practical approach to the specific questions of usage can be made.

Usage as thus defined does not arise in a single and uniform way in a speech. Strictly speaking, perfect uniformity does not probably exist between any two speakers. Individual differences are inevitable, due to the different physical and mental constitutions of any two individuals. There is, however, in all practical use of language, what might be called an area of negligible variation. Practical speech does not demand absolute uniformity, since only an approximately uniform use is necessary to intelligibility. Consequently we make allowance for differences, and assume that those speakers who, in the main, speak as we do, belong to our group. There arise thus what are technically known as dialects. In the popular sense of the term, dialect means the speech of a local, or somewhat illiterate section of the public, which differs from and is less admirable than the so-called standard speech. Scientifically, however, dialect means merely the speech of a group of people which has sufficient homogeneity to enable the members of the group to realize themselves as parts of a speech unity, and which enables the descriptive student of the dialect to state its characteristics in a way which distinguishes it from other unified speech groups. Thus the scientific student of language speaks of the Indo-European dialects, meaning thereby the various speeches of Europe and Asia which belong to the general Indo-European family of languages. In the same way, he speaks of the Germanic dialects, meaning the various Scandinavian, German, and English idioms which have similarities enough in common to show that they all belong to one general branch of the Indo-European family, but also distinctive differences enough to justify the student in regarding each as a separate and homogeneous unity. Continuing this method of differentiation, we can speak of the English dialects, meaning thereby those different forms of the English speech which differ among themselves, but which also resemble each other sufficiently to justify us in holding them together as one speech.

Now it is obvious that the area of negligible variation must be increased in proportion as one extends the limits of inclusion within a single speech, or within a branch or family of languages. In order to assume the existence of a single, unified English speech, it is necessary to overlook all the many distinctions which go to make up individual and local modes of speech. And if we include English, German, and Scandinavian as members of a Germanic branch representing a unified parent Germanic, it is manifestly necessary to allow for many more discrepancies between the various members of the branch.

This prepares the way for a definition of standard speech. A standard speech is the sum of those similarities among the different members of a speech community, which together constitute the grounds for assuming the existence of a uniform and single practice in the speech. In this relative sense the term "standard" must apply to the practice of everybody who uses any form of the speech; and the broadest English standard would consequently have to include the speech of Englishmen, Americans, Australians, Canadians, — of every individual who anywhere spoke what might justly be called a form of the English tongue. Or standard English might be limited indefinitely, to include only the speech of America, or of Virginia, or of Chicago, or of "educated" as contrasted with "uneducated" speakers, of "good" society as contrasted with "vulgar" society, and so forth, without end. It should not be overlooked, however, that any such standard speech is theoretical, and if the statement made above is true that individual variation is permanent, a standard speech always must be a theoretical idea. In other words, a standard speech is a theoretical norm established by an artificial grouping of similarities, and is not, in any scientific understanding of the processes of language, either the authorized edict or practice and example of any individual or group of individuals. It is a further corollary of this definition of standard speech, that the more inclusive the standard, the less intimate and personal, and the more general and conventional, are the ideas and feelings which can be expressed by the forms of language which are subsumed under the theoretical unity of the standard. The elements of the English language, for example, which are common to the whole race of English-speaking people, would hardly be adequate for more than the simplest and most colorless kind of intercommunication. In character it would approach an artificial language, and of course an artificial language it would be. Indeed, one of the most recent and best of artifical languages, Ido, is constructed on this principle of forming a standard European speech by grouping into one speech those elements which are common to all or to the greatest number of the languages of Europe.

Practically the question of standard is often approached by an arbitrary assumption of the right of one particular group of speakers to represent this theoretical standard of which we have been speaking. In countries and periods in which royal authority counted heavily, it was often assumed that the court best represented the standard speech. Often also a capital city, as the center of civilization in the country, was assumed to give in the speech of its citizens the model for the rest of the nation, as Paris is supposed to do for France. Or again the speech of a particular class of society has been frequently taken as summing up the general and standard characteristics of the speech. In our day, owing to the important position which formal education occupies, the practice of the "educated classes" becomes the theoretical standard. Whatever the standard chosen, however, whether it be a geographical, a social, or an educational standard, it should be observed that the choice rests entirely with the individual, and is determined by his own powers or experiences in observation and by his own predilections after he has made his own observations. The assumption of any one standard as absolutely right and to be imposed upon all users of the language is obviously a piece of sheer dogmatism which could be carried into effect only by the exercise of an autocratic authority of a kind such as the English language has never submitted to. It is hardly necessary to state that dictionaries have no such authority; at their best they are merely a summary of the widest national or international use of the language, but a summary which in the nature of things cannot be contemporary. Language changes from day to day, but dictionaries change not at all, or only at long intervals.

Such being the manner of the establishment of standard or customary use, the second question is one of values in determining actual practice in language. By the circumstances of birth, education, and environment, each individual is naturally and necessarily provided with a form of speech which is general or standard within its group. The unthinking person, or the one whose mind is never projected outside his group, never calls in question the forms of his natural speech.. But the person who finds his speech in conflict with that of some other person, or group of persons, whether the differences be due to geographical or social causes, is bound to consider the value of his own as compared with the other speech. In other words, there arises then a question of divided use, or a conflict of standards, and manifestly the first necessity is to determine the value of the standard which one wishes to apply as regulating practice. It is equally manifest that no single prescription can be given determining the values of different standards. It cannot be said that the most general, international usage in English is thereby absolutely the best, since there are many occasions, for example the familiar conversation of daily life, in which the formal, general standard would be inappropriate. Likewise it cannot be said that the strict rules of formal grammar are best and right merely because they are accepted in theoretical descriptions of the language, and that deviations from the strict system are wrong, even though they may be current in the colloquial practical use of the language. Rhetorical and other books contain many dogmas, for example the rule against the split infinitive, against ending a sentence with a preposition, etc., which are often contrary both to practice and effectiveness in language. In default of any abstract or absolute test of value in usage, the only method left is a relative and practical one. The only general rule that can be given when a question of choice between two uses in language arises, is to choose the form or use which will most effectively attain the end which the person seeks to attain upon whom the necessity of choice falls. If through habit a speaker is accustomed to use a form like "He don't," and is then confronted with the statement of grammars and also the practice of many speakers who use the form "He doesn't," he must decide for himself whether the use of his habitual mode of speaking operates to his disadvantage, and if so, whether it is worth his while to acquire a new habit. The purpose of language being to convey certain ideas from one person to another, the use of language should be determined by its adequacy to attain this end. Any forms of language which for any reason whatever, either explicitly or implicitly, convey ideas which the user of these forms did not intend to convey, is in so far an inadequate use of language, and should be corrected by a more effective application of standards of value in the use of the language. It is true, however, that language exists not only for purposes of intercommunication, but also for purposes of individual self-expression; and a speaker may prefer to use a form of language which satisfies his own sense of the proper and effective, even though he knows his language will not carry his message to the person whom he is addressing. In such instances the speaker must be content with having satisfied himself, and must not complain of the inadequacies of speech, unless he is quite sure that the language does not provide what can satisfy his hearer as well as himself in the expression of what he would say. G. P. K.

See DICTIONARIES; GRAMMAR, ENGLISH; LANGUAGES, ARTIFICIAL; SPELLING, USAGE IN, etc.

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See also books on Rhetoric, which usually contain some chapters on the subject.

ENLIGHTENMENT AND EDUCATION.— "Enlightenment" is a term that is used to characterize the particular phase of philosophical speculation which falls in the main within the period of the eighteenth century. Beginning in England, this movement of thought spread to France and Germany, under the names, *l'Éclaircissement* and *die Aufklärung* respectively. This name, whether in its English, French, or German form, serves to picture to our minds the essential characteristics of an age which sought its illumination in the light of reason, while authority and tradition were assigned a place of secondary consideration, or else discarded altogether. There was a demand in this period for the free play of the individual judgment, and an accompanying protest against all abtruse metaphysical speculations which endeavor to transcend the normal and usual processes of reason. All investigation, it was insisted, must begin with the interpretation of our ordinary experiences, according to our knowledge of the natural causes underlying them. The age was individualistic and naturalistic, magnifying the present and scornful of the past. Its influences were not confined simply to the sphere of the schools, nor were its interests purely speculative. Its philosophy had its practical outcome as well, and profoundly affected the life of the people, on its religious, moral, and political side. The theory and practice of education were not free from the influences of these characteristic tendencies.

Educationally the Enlightenment helped to reënforce the acceptance of education as a discipline for the development of the reasoning abilities. At this period, perhaps, more than ever, the child was regarded as an adult in miniature. Hence the same kind of formalism was expected from the young as from the old. In school practice it is difficult to dissociate the influence of the Enlightenment from the disciplinary tendency in education. Locke (*q.v.*) may be taken as an early representative of both movements, just as Rousseau and the naturalistic movement represent the individualistic tendency, which resulted from the Enlightenment. Since the Enlightenment affected educational practice only by presenting a new aim, the development of reason, to which the existing curriculum was to be directed, it did not involve the introduction of a new type of institution. The general bearing of the entire period will be discussed more under ROUSSEAU and the NATURALISTIC MOVEMENT IN EDUCATION. J. G. H.

See also LOCKE; VOLTAIRE; CHESTERFIELD; DIDEROT; FREDERICK THE GREAT; ENCYCLOPEDISTS.

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ENOS, JAMES L. (1830–1906). — First president of the National Teachers' Association (*q.v.*), for many years engaged in educational work in Iowa as principal of the schools at Cedar Rapids and editor of the *Voice of Iowa* (the official educational journal of the state). He was one of the founders of the Iowa state teachers' association and the National Teachers' Association. Author of a series of arithmetics. W. S. M.

ENRICHMENT OF THE CURRICULUM. —The process of expanding the course of study so as to include a wider range of activities. The movement for the enrichment of the curriculum has been a characteristic expression of school reform during the latter part of the nineteenth century. It has had its largest influence in the elementary school. Enrichment does not merely refer to the addition of new school subjects; it includes the reform of the older subjects. It has expressed itself in the addition of an abundance of content in the traditional formal subjects, and in the increased use of concrete and active methods of learning. The whole tendency has been in the direction of augmenting the curriculum with experiences and activities that would be more varied, natural, useful, and interesting. H. S.

See COURSE OF STUDY, THEORY OF.

ENROLLMENT. — See RECORDS AND REPORTS.

ENTRANCE REQUIREMENTS.— See COLLEGE, AMERICAN, REQUIREMENTS FOR ADMISSION.

ENUNCIATION. — The act of enunciation or utterance is frequently an object of special drill in the teaching of reading, more particularly with beginners in reading. The aim is to gain a distinct pronunciation. Various devices are used in these enunciation drills, such as phonetic spelling, syllabification, word building, etc. H. S.

See READING, TEACHING OF.

ENVIRONMENT AND ORGANISM. — These terms are as strictly correlative as are brother and sister, buyer and seller, stimulus and response. Wherever there are correlative terms, there is a third medium to which both refer. In the case of organism and environment, this more comprehensive matter is life as a self-conserving, expanding activity. (See FUNCTION.) Life is a process which includes environment as well as organism within itself ; if we are apt to connect life with the organism and not with the environment, this only means that its connection with the former is direct, and with the latter indirect, or by means of the organism. But this indirect connection, when examined, is readily interpreted to mean that the organism itself is only a device for making the environment an included part of a life activity. We shall first expound the meaning of this formula of the subordination of both organism and environment to life or function; and then apply the results to educational theory, in which the school as an institution represents the environment side and the pupils the organism side.

The environment of any organism consists of the sum total of conditions that enter in an active way into the direction of the functions of any living being. Environment, therefore, is not equivalent merely to surrounding physical conditions. There may be much in the physical surroundings to which an organism is irresponsive; such conditions are no part of its true environment. Whatever affords it food, whatever threatens it, whatever protects it against menace, whatever operates as signal to direct it toward food or a mate, or away from an enemy, — such conditions are true constituents of its environment. Consequently environments change with the development of the organism, individual and racial. The young of a species react to fewer and more generalized stimuli, as a rule, than the mature specimens of the same species. The lower forms of life are so undifferentiated in their functions that they have a comparatively homogeneous environment, living for the most part in a liquid medium, and reacting only to a few simple mechanical and chemical changes. As organisms grow, and their functions are differentiated through special structures to exercise each, the environment gets correspondingly heterogeneous and complex. With free locomotion and a nervous system the environment comes to include great stretches not only of space, but of time, since by retention and memory the animal becomes capable of reacting to conditions of its past life. There is, then, a genuine sense in which the evolution of life, the increase in diversity and interdependence of life functions, means an evolution of new environments just as truly as of new organs.

The greatest change of environment occurs when living beings become conscious of the fact that their reactions to preëxistent stimuli modify the old forms in such a way as to create new or different stimuli. When living beings become aware of this fact, modification of the environment for the sake of getting stimuli that will make the exercise of functions more secure, more effective, and freer, becomes a deliberate end. This transformation is familiar to us in the form of the tools, the utensils, weapons, devices of all kinds, by which man consciously modified the environment in the interest of the exercise of his own life activities. In this way, some parts at least of the environment become what have been called "extra-organic" organs ; that is to say, all the tools and devices of all the arts, although outside the body, operate in behalf of the functions of life just as do the eye, stomach, hands, etc. From this biological point of view, deliberate or conscious behavior is just a way of doing more effectively and economically what unconscious life adaptations do in a relatively wasteful and uncontrolled way, namely, modifying the environment so as to make it a more varied and more stable or secure stimulus for the exercise of functions.

A part of this work of transforming the environment in the interests of life has to do with selecting and maintaining the environment which is best adapted to promote the growth of the young or immature towards full participation in the life activities of the community to which they belong. This specially adapted environment constitutes the educational agencies which a given community employs. The community, in order to maintain its own life, must control the direction taken by the growing capacities of all its immature members, since in time these will replace the mature members, and hence constitute, in turn, the community. No such thing as purely direct control is possible, however. Control of direction of growth must take place indirectly through selecting and loading, as it were, the stimuli which evoke responses and hereby determine habits. In simple, savage groups, the existing habits of the elders are enough to give such direction ; direct participation and reproduction in play suffice for the required development. As a society gets more complex, and its arts more elaborate, a special environment has to be provided, and the school as a special institution comes into existence. From the biological standpoint, accordingly, the school with all its subject matter, apparatus, and guiding personalities (teachers, etc.) constitutes a set of specially selected and arranged stimuli for the sake of evoking and forming certain standard types of response on the part of the life functions. J. D.

See ADAPTATION AND CONTROL.

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See also the list of references to PHILOSOPHY OF EDUCATION and to the other articles to which cross references are given in the text.

EPICTETUS. — Stoic philosopher and teacher; born at Hierapolis in Phrygia about the year 60 A.D. In his early life he was the slave of Epaphroditus, one of Nero's courtiers, who treated him cruelly, but, perhaps in expiation of his severity, permitted him to attend the lectures of Musonius Rufus. Later, by what means is not known, Epictetus obtained his freedom and himself became a teacher of the Stoic philosophy. When, in the year 90 A.D., the philosophers were banished from Rome by decree of Domitian, he removed to Nicopolis in Epirus, where he continued to teach for some years. He was highly esteemed, both for the nobility of his character and the spirit and content of his teaching. He wrote nothing himself, but his discourses and conversations were taken down by his pupil Arrian and published in two treatises, — *The Discourses* (*Diatribai*), and the *Manual* (*Enchiridion*). Epictetus accepted the Stoic doctrine of natural or innate moral principles, the superiority of reason to all other faculties, and the supremacy of the will. " The nature and essence of the good is in a certain disposition of the will; likewise that of the evil. What, then, are outward things? Matter for the will, about which being occupied, it shall obtain its own good or evil." We cannot choose the ideas which present themselves to us, and we must accept events as the pervading reason of the universe determines them, but reason should rule among perceptions, and the will should placidly assent to whatever fortune the God immanent in nature sends. Even death itself is nothing terrible to the wise man. The aim and spirit of education as conceived by Epictetus may be thus stated in his own words: " And now I am your teacher and ye are being taught by me. And I have this aim — to perfect you, that ye be unhindered, uncompelled, unembarrassed, free, prosperous, happy, looking unto God alone in all things great and small." Of the eight books of the *Discourses* collected by Arrian, four have been lost. The extant works have been translated and published in English in various editions.

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EPICURUS (341–270 B.C.). — Greek philosopher, the son of an Athenian schoolmaster; born on the island of Samos in 341 B.C. He claimed to have been self-taught, but evidently had some training in the philosophy of Democritus and other previous systems. He first taught in Mitylene and Lampsacus, and in 306 established himself in Athens. Here he purchased his famous Garden to the northwest of the city on the road to the Academy, and in it opened his school. Even women and slaves were admitted, and proselytes were rapidly added, as much through the personality of the founder as the popularity of his doctrines. Epicurus never married, and took no part in political life, but in happy seclusion devoted himself to the development of his philosophy. He was revered almost as a god by his followers, and his system was never changed in any of its essentials. His health was always feeble, but he lived until his seventy-second year (270 B.C.). By his will he left the Garden to the successive heads of the school.

Epicurus wrote voluminously upon ethics, physics, and theology, producing some three hundred rolls. His work *On Nature* alone was said to have filled thirty-seven rolls. Selections from his teachings, known as *Golden Maxims*, were handed down from generation to generation, and the *Letters* to and from his friends were preserved for several centuries. All his writings, however, except the *Maxims* and three of the didactic *Letters*, afterward disappeared, although parts of his treatise *On Nature* have been recovered from Herculaneum. The chief sources of our present knowledge of his system are found in Book X of Diogenes Laertius, *Lives of the Philosophers*, and in the poetic descriptions of Lucretius. *On the Nature of Things.* The philosophy of Epicurus, like that of the post-Aristotelian period generally, was an outgrowth of the collapse of Greek life. It centered about ethics, but failed to emphasize participation in social life as essential to the individual. Epicurus agreed with the Cyrenaics in making pleasure the goal. While he could not conceive of happiness altogether apart from bodily enjoyment, unlike Aristippus, he emphasized duration and permanency, rather than intensity, of pleasure. He disparaged all positive pleasures as compared with a philosophic poise of mind, advocating an independence of the world and a freedom from emotion (*ataraxia*, imperturbability). " If thou wilt make a man happy, add not unto his riches, but take away from his desires." While pleasure with Epicurus was chiefly mental, it consisted in repose and pleasing conversation with friends rather than strenuous study. He regarded as superfluous all knowledge that did not promote happiness, and rather deprecated culture and the current education. Hence the atomistic physics of Epicurus, which has sometimes given him the reputation of being " the first scientist," was merely ancillary to his ethics, and was for the most part borrowed from Democritus. Epicurus attempted a scientific explanation of the universe only so far as this might rid one of religion, which he considered the greatest foe to peace of mind. He wished to substitute a purely natural and mechanical interpretation for the idea of a world ruled by gods, who must be propitiated. He explained the constitution of the universe by "atoms" and the space in which they move. All things were formed by the impact and combination of an infinite number of indestructible atoms. Even the soul is composed of finer particles, and these are scattered after death. Freedom of the will, which was required by his ethical doctrine, Epicurus saved by modifying the "necessity" and mechanical law of Democritus with an imperceptible "swerve" and spontaneity in the atoms.

The philosophy of Epicurus appealed strongly to the times. For two centuries it spread rapidly through Greece, Italy, and even the barbarian world, although there was occasionally much resistance on the score of effeminacy and irreligion. The Epicurean opposition to culture also kept its doctrines from wide acceptance in Greece, but from their practical nature they found a congenial soil in Rome, where they were introduced about the middle of the second century B.C. Epicureanism was chosen as a theme by a multitude of Roman writers, including the celebrated Lucretius, and the works of Catullus, Vergil, and Horace attest its influence. The emperor, Marcus Aurelius, in 176 A.D., put the Epicurean school at Athens upon a footing of equal endowment with the three other post-Aristotelian schools, and, according to Diogenes, it was still in existence as an organization a century later. During the Empire, Epicureanism was perverted to the luxuriousness of the times, and, by the beginning of the Middle Ages, had faded away, except as a term of reproach. With the awakening of natural impulses and the joy in living of the Renaissance, the Italian humanists, such as Petrarch, Boccaccio, Bruni, Guarino, Vittorino, and Valla, show decided views of Epicureanism in their educational theories and practices. In the upper countries this departure from medieval asceticism and otherworldliness becomes more marked in the pedagogy of the humanists, Erasmus, Elyot, and Ascham; of the reformers, Luther, Melanchthon, and Neander; and especially of the realistic innovators, Rabelais and Montaigne. In the seventeenth century Epicureanism was revived as a regular system by Gassendi, and for a time found many advocates. During the eighteenth century Epicurean tendencies are discernible in the brilliant rationalism of Voltaire and the Encyclopedists, and in Rousseau's summons to return from the artificialities of civilization to nature and natural pleasures. In the nineteenth century a suggestion of Epicurus is found in Bentham, with his pleasant retirement, his foundation of morality upon an intelligent basis of fact, and his careful calculation of pleasures. There is some similarity, too, in Comte's relations with his pupils and admirers, and in certain aspects of his positivistic philosophy, while the "higher pleasures" of Spencer's utilitarianism remind one strongly of Epicurus. F. P. C.

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EPIDEMICS AMONG SCHOOL CHILDREN. — See Contagious Diseases.

EPILEPSY. — A name given to a disease or a series of diseases that in their symptomatology closely resemble one another. All kinds of epilepsy have in common suddenly appearing attacks. A common, but by no means a constant, symptom is a series of convulsions which involve the whole or large areas of the body. All convulsions, are, however, not necessarily epileptic in character. The hyperkinetic phenomena attending intoxications, the seizures accompanying certain brain diseases, and the tonic and clonic spasms accompanying other bodily irritations are rather epileptoid than epileptic (see Convulsion). The true, or so-called idiopathic, epilepsy may be due to different causes, and may, etiologically considered, be a number of diseases. The pathology of the true epilepsies has not been satisfactorily determined, but at times distinct cerebral lesions have been discovered to be associated with the condition. The causes of epilepsy are only vaguely known. Heredity appears to play an important part, for it is found that many epileptics have among their forbears individuals similarly affected, or hysteric, or with other psychoneuroses.

It has, however, been noted that the convulsions in early childhood, those due to eclampsia and to digestive and dentition disturbances, are sometimes followed by real epilepsy, which begins at about the age of puberty. It is also found that children with night fears, with nocturnal enuresis, etc., often fall into an epileptic state at the critical period of puberty, and the early phenomena are supposed to bear some relation to the later convulsive attacks. The idiopathic epilepsy begins before the age of thirty, most of the cases developing near the pubertal period. The two sexes are equally affected, although uterine disease is given as one of the causes by some authors.

The development of the epileptic condition is so often found to be associated with general bodily disturbances, such as the intoxications from alcohol, lead, morphine, and other narcotics, and with a general irritability due to local conditions, such as eyestrain, decayed teeth, intestinal parasites, nasal growths, etc., that these are usually considered to be exciting causes. It may be said that any bodily disturbance may bring about a convulsion, if the nervous effect of the disturbance be a prominent feature of it. The nervous factor is undoubtedly the important one. In fact, it has been found that the initial epileptic attack has been produced by mental injuries alone. The epileptic attack may take one of three forms: grand mal, petit mal, and the psychic equivalent. The grand mal type is common, and consists of violent motor disturbances; the petit mal type is often associated with the grand mal, and consists of temporary unconsciousness with slight or no motor hyperkinesis; and the psychic equivalents are less frequent than either of the other types, and consist of mental derangements of a periodic and temporary character.

It is almost impossible to describe the psychic equivalents of epilepsy, on account of their great variety and their inconsistency. They usually consist of the performance of abnormal acts, including speech, with an amnesia for the period during which the attack persists. During such an attack an individual may assail, and even kill, a friend, may become capricious and indecent, and in general do all kinds of unlawful acts. This condition may last for only a few minutes or hours, or it may continue for several days, to be followed by a normal period with an amnesia for the time of the attack. It is of interest to note that migraine is believed by some authors to be a sensory equivalent of epilepsy.

Improvement, sometimes recovery, takes place when all sources of irritation are removed and good hygienic surroundings are provided. The best care and the best conditions are not to be found outside of special institutions, and it is to the interest of the individual and of the community that such patients should be segregated. Under no circumstances should a child with epilepsy be permitted to remain in the same class with otherwise normal children, for the power of suggestion is so great that the sight of a convulsion may start a psychosis in individual children or in the group. (See Hysteria.)

Mentally, epileptic children may be bright, even abnormally so, but usually they are dull and behind the children of their age. The periods of confusion and of stupidity following convulsions make the child unfit for any mental work, and there is produced a condition of retardation on account of the loss of instruction and of the inability to make up the lost time. This is an added reason why such children should be segregated, for their mental wants may be best taken care of where their mental and physical conditions are best understood.

S. I. F.

See Convulsions.

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EPIPHANIUS. — One of the most learned men of the fourth century, born in Palestine about 315 A.D. and educated in the Hebrew schools. He spoke five languages, Hebrew, Syriac, Egyptian, Greek, and Latin. For the last thirty-six years of his life he was Bishop of Salamis in Cyprus. He was an ardent promoter of monasticism, and a doughty antagonist of the philosophic treatment of the Christian faith, which most of the Greek fathers regarded with favor. He was a fanatical opponent of the theology of Origen (*q.v.*). His learning was encyclopedic, but not exact. As a writer he was uncritical and credulous, but we are indebted to him for the preservation of many valuable fragments of ancient writings and traditions. He regarded it as his life work to defend the Christian faith by combating heresy in all its forms. He has left us two great polemical treatises: the *Ancoratus,* in which he strives to " anchor " the Church by defining the true faith; and the vast *Panarion,* a " medicine chest " of remedies for all the poisonous forms of error, in which he describes and refutes eighty different heresies and wins for himself the designation, " the sleuth-hound of heresy."

W. R.

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EPIPHENOMENON. —This word is frequently used in psychological discussions, where it is pointed out that consciousness cannot be treated as a cause in the same sense that physical energy can be treated as a cause. Since consciousness is not a cause to be reckoned with in physical formulas, it has sometimes been regarded as the mere reflection of reality, not affecting the world in any wise, but simply appearing as the parallel of the real facts of the physical world. Such a view relieves the psychologist from the task of showing a definite causal relation between mental processes and physical processes. As a theoretical device it has been of some value. It has, however, complicated discussions of consciousness by rendering obscure the causal concept and mystifying many readers who recognize consciousness as the most obvious fact in experience, even though it is a type of reality which cannot be included in physical formulas.

C. H. J.

See Body and Mind.

EPISCOPAL SCHOOLS. — See Bishops' Schools; Christian Church; Church Schools, etc.

EPISCOPAL THEOLOGICAL SCHOOL, CAMBRIDGE, MASS. — A school for the education of young men for the ministry of the Protestant Episcopal Church, opened in

1867. Candidates for degrees in divinity must present a college degree on entrance, and all candidates must have a knowledge of Greek, although facilities are offered for special students. The students enjoy certain privileges at Harvard University.

EPISTEMOLOGY. — The theory or doctrine of knowledge; more especially, an account of the possibility of true or valid knowledge, of its nature and extent or limits. In Greek thought this discipline, as distinct from logic and psychology, can hardly be said to have existed. The Greek mode of approach was objective; it conceived of knowledge, whether true or false, as a relation or function of things of different sorts. True knowledge was due to the operation of stable, universal, self-consistent being; falsity to an intermixture of becoming, non-being, particularity, and mere potentiality. Thus questions as to the nature of knowledge were distributed between logic and metaphysics. Even so far as questions arose as to the respective values of sensation and reason in purveying knowledge, sensation and thought were conceived of not as powers or states of individual mind or consciousness, but as ways in which things manifested themselves. In both Plato and Aristotle, mind and all conscious operations were thought of as perfections, as completions, of objective existence, not as the original data from which a discussion of knowledge must set out.

Epistemology as a distinct branch of philosophy developed out of the growth of individualism. The tendency of nominalism was to make mind or consciousness a possession of individual selves or souls. Then it naturally became a problem how the individual could get outside of himself to know an exterior world. The problem was accentuated by the development of physical science. In Greek thought there was no sharp distinction between physical and ideal (mental and moral) characteristics, for the objective world was regarded as one of *qualitative diversities.* Under the influence first of Neo-Platonism and then of Aristotelianism, scholastic philosophy had recognized a graded, or hierarchical, order of qualitative values, up from "first matter," which had least of ideal quality through an ascending hierarchy of existences, up to God as pure intelligence and love. But when physical science reduced the seeming heterogeneity of the objective universe to homogeneity, finding but one kind of matter and one type of motion throughout its entire extent, the objective world was inevitably conceived of as marked only by mechanical and quantitative distinctions. Not only was it stripped of moral and æsthetic values, but of odor, color, sound, etc. Another place or abode had then to be found for all distinctions of value and quality. Mind or consciousness was naturally taken as their seat or residence. The classic antithesis of mind as ideal and teleological, and matter as brute, inert, anti-purposive, was now identified with the difference between the knowing mind and the objective world known. From this dualism, practically unknown to either the Greek or the medieval world, modern philosophy in Descartes and Locke sets out.

Given, then, a knower who is purely individual or "subjective," and whose being is wholly psychical and immaterial (all qualitative differences being psychical and immaterial), and a world to be known which is purely universal or "objective," and whose being is wholly mechanical and physical, the problem of how knowledge is possible is an inevitable one. Knower and known being conceived in absolutely opposed terms, the question arises as to *how* and as to how *far* the gulf between them can be spanned — for knowledge clearly implies that the gulf is spanned. All that portion of modern philosophy which discusses the possibility, nature, and limits of knowledge, or the basis of these presuppositions constitutes Epistemology. Various modes of solution constitute the various forms of realism, idealism, phenomenalism (*qq.v.*), current in modern philosophy.

A marked tendency of existing thought is giving up the attempt of a search for a solution, not on the ground that the problem is insoluble (philosophic agnosticism), but on the ground that it is artificial. In other words, there is a growing tendency to question the sharp setting over of the individual self against nature, and of the qualitative and ideal phases of existence against its quantitative and mechanical traits. The theory of evolution (*q.v.*) with its insistence upon continuity has doubtless been the chief cause from the scientific side of this changing attitude, while from the philosophic side the more careful analysis of experience (*q.v.*) has led to the view that the distinctions of the individual and the universal, the psychical and the physical, the natural and the ideal, are distinctions of functions of existence rather than of structural elements of existence. J. D.

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EPISTOLÆ. — The art of letter writing was cultivated as an educational method in the sixteenth and succeeding centuries. Of all written methods, it was supposed to approach nearest to the use of the Colloquy, which was the simplest step to take in teaching Latin speaking (see COLLOQUIES). Latin letter writing thus was helpful for written composition and also for providing material in Latin conversation. John Brinsley (*q.v.*) in his *Ludus Literarius* devotes a chapter to the " making epistles imitating Tully " (*i.e.* Cicero). He says epistles should be " short, pithy, sweet Latin, and familiar." The master's method was to read to the pupils Cicero's *Epistles*, and some part of Macropedius or Hegendorffinus' *De Conscribendis Epistolis.* The rules laid down in those authors, says Brinsley, were to be explained and the examples made clear. The boys were to be informed that an epistle is nothing but a letter sent to a friend, " to notify him of some matter or to signify our mind plainly and fully unto him." Brinsley requires practice in imitating Cicero's *Epistles*, and in framing answers to his letters, first in English, then in Latin. Charles Hoole (*q.v.*), in his *New Discovery of the Old Art of Teaching School* (1660), writes with still fuller directions — giving model examples of boys' imitations and adaptations of Cicero's epistles. Besides reading Cicero's *Epistles*, the boy should gather likely phrases for letter writing from other authors, especially Terence. All such phrases should be entered, during the course of reading authors, in a notebook, divided into certain headings, easy of reference. Variation of expression should be sought. For this purpose Hoole recommends Erasmus' *De Copia Rerum et Verborum* and John Clarke's (*q.v.*) *Dux Oratorius.* Hoole's method of teaching boys letter writing is as follows. Ask a boy to whom he proposes to write his letter, and the subject of it. Then get the whole class to see who can write the most suitable letter in English, and how quickly. Amend the imperfections in each exercise. Take the best English letter, and let each boy give a Latin expression of his own, gathering from each boy words and phrases, and seek as much variety as possible. Put all those accepted down in writing, and then let the scholars write the Latin letter with the collected phrases before him for choice. One point of the exercise was to avoid barbarisms and anglicisms. Hoole advises that those who wish to write letters well should read good examples often, therefore boys in the upper forms should often read all Tully's *Epistles*, and sometimes should read from those of Pliny, Seneca, Erasmus, Lipsius, Manutius, Ascham, Politian, and " whatever they find in the school library, which should be very well furnished with epistolary books." In letter writing, Hoole claims that pupils should never " go about a new letter until they have finished what they had begun."

Letter writing, both in Latin and English, occupied a much more important place even in the eighteenth century than now, as an educational exercise. For the long news letters of our ancestors took the place of the modern newspaper, and accordingly practice in letter writing was a subject of practical importance in the schools, both for boys and girls. On account of familiarity with actual letter writing as a school exercise, early novels consisting of long interchanges of correspondence between the characters did not probably cause the sense of dullness with which they are apt to affect the modern reader.

D. G. Morhof in his *De Ratione Conscribendarum Epistolarum libellus* (Lübeck, 1716) gives a list of writers on the art and method of composing epistles. The list is surprisingly long, and includes the following: Demetrius Phalereus, Gregory Nazianzen, John Altenstaig, Raphael Brandolinus, Conrad Celtes, Ludovicus Vives, Erasmus Roterodamus, Melchior Junius, Lipsius, Johannes Voellus, Johannes Simonius, George Fabricius, Christopher Hegendorphinus, George Macropedius, John Mulinus, Simon Verepæus, Jodocus Jungmann, George Heunischius, J. H. Alsted, B. Keckermann, Henry Bebelius, Rocchiuse Pilorcius, Thomas Sagittarius, Timplerus. " Whosoever desires more names," adds Morhof, " let him refer to the *Bibliothecæ* of Conrad Gesner and George Drandius — not to mention other books." The most complete textbook on English letter writing is entitled: *The English Secretarie. — Wherein is contained a perfect method for the inditing of all manner of epistles and familiar letters, together with their diversities, enlarged by examples under their severall Tyes. In which is layd forth a Pathwaye, so apt, plainer and easier, to any learner's capacity, as like whereof hath not at any time heretofore beene delivered. Now first devized and newly published by Angel Day* (1586). One of the best collections of English letters up to the date of its publication (1789) was in the series of *Elegant Extracts* (*Epistles*) by Vicesimus Knox, Headmaster of Tonbridge School, Kent (1778–1812), who wrote an interesting chapter on letter writing in his work on Education. F. W.

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EPISTOLÆ VIRORUM OBSCURORUM. — A *jeu d'esprit* which is of considerable historical value as indicating the state of education in the universities in the early days of the humanistic movement, as well as forming one of the incidents which heralded the Reformation. Actually the *Letters of Obscure Men* were parodies of the *Letters of Illustrious Men* (*Clarorum Virorum Epistolæ*) addressed to Reuchlin and published to aid him before the Pope against the attacks of the Dominicans.

The *Epistolæ Virorum Obscurorum* purported to be letters addressed by admirers to Ortuinus Gratius, Professor of Arts at the University of Cologne, a center of reaction and obscurantism. They appeared in 1515, and there was considerable conjecture as to their authorship, Erasmus and Reuchlin himself being among those suggested. But the real authors were Hermann Busch, Crotius Rubianus, Wolfgang Angst, and to a later addition in 1519 Ulrich von Hutten contributed. The letters were published at Hagenau, but bore the address of the Aldine Press at Venice. The letters are written to the professor by young graduates in the worst possible Latin. No grammatical rules or idiom are observed, and the vocabulary is far from classical. The contents include accounts of the daily life of the correspondents, and express the narrowness of their intellectual views and activities as well as the dissoluteness of their lives. In educational history, they are chiefly important for the bitter opposition which is expressed against the introduction of humanistic studies and against the young " poets " who are beginning to assert themselves at the universities. The characters, which, however burlesque, were no doubt based on fact, are convicted of quibbling, straw splitting, ignorance of classics, and contempt for scholarship. According to Erasmus, the friars and monks took the work seriously as a tribute to their intellectual standing and achievements until a letter in the second volume shattered their illusions. The *Letters* were received with great acclamation by the whole intellectual world at the time, and if for the present century the humor which caused Erasmus to burst a pustule on his face with laughing is not so strongly apparent, the picture presented of the reactionary friars and opponents of humanism is as forceful as ever.

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EPITOME METHOD. — The extensive study of a subject through the use of outlines, abstracts or summaries. This method is much used in the study of history, and is supplemental to the more intensive treatment of special periods, epochs, or movements.

See HISTORY, TEACHING OF; EPOCHAL METHOD; EXTENSIVE METHOD.

EPOCHAL METHOD IN HISTORY. — A study of history by periods or epochs. This intensive and more detailed method of procedure is frequently contrasted with the mode of teaching which employs outlines, abstracts, or epitomes. The two methods, regarded as competitive, form the basis of a controversy current among teachers of history. A broader view would regard the two methods as supplementary. The use of outlines gives the broad setting and the continuity necessary to history study, but it lacks the thorough study of detail which characterizes the intensive study of history by periods. Because of the limit of time, the epochal treatment, on the contrary may leave the pupil quite ignorant of many periods and movements in history.

H. S.

See HISTORY, TEACHING OF; EPITOME METHOD; INTENSIVE METHOD.

EPSON COLLEGE. — See GRAMMAR SCHOOLS, ENGLISH; COLLEGES, ENGLISH; PUBLIC SCHOOLS.

EPWORTH UNIVERSITY, OKLAHOMA CITY, OKL. — A coeducational institution established in 1904. Academic, collegiate, engineering, kindergarten training, commercial, pharmacy, medicine, law, music, oratory, painting courses are offered. A summer school of theology is maintained. The entrance requirements to the college are equivalent to about four years of high school work; certificates of affiliated high schools are accepted in place of examination. The degrees of A.B., B.S., Ph.B., are conferred on the completion of the appropriate courses. The faculty numbers eighty-four professors and instructors.

EQUAL PAY. — See TEACHERS, SALARY OF.

EQUATION. — An expression of equality between two quantities, as 2 lb. = 32 oz., or $x + 7 = 15$. In algebra (*q.v.*) the word is generally used to mean an expression of equality in which one or more unknown quantities enter. Thus in algebra, and particularly in the theory of equations, the expressions $5 = 4 + 1$ and $(a + b)^2 = a^2 + 2ab + b^2$ are not always called equations, but the former is spoken of as an equality and the latter as an identity. An identity is, therefore, an expression of equality that is true for any values of the letters involved, while an equation is an expression of equality that is true only for special values of a quantity considered as unknown. In elementary algebra this distinction was formerly made, and is often made at present, by speaking of $x + 7 = 15$ as an equation of condition, the condition being that x shall equal 8. The usage is not uniform at present, but the question is not of enough importance to give any trouble in teaching.

Equations are classified in various ways. The classifications first met in teaching are as follows: As to degree, an equation is of the first degree if the terms containing the unknown quantities are all of the first degree, as in the case of $x + 7 = 15$, or of the two equations $x + y = 10$, $x - y = 6$. An equation of the first degree is also said to be linear, because in analytic geometry such an equation involving one or two unknowns is represented by a straight line. Such an equation is also called a simple equation. An equation of the second degree, or a quadratic equation, involves a term of the second degree, as in the case of $x^2 - 7x + 10 = 0$, or of the two equations $xy = 12$, $x^2 + y^2 = 25$. An equation of the third degree, a cubic equation, involving one unknown quantity, has as its type form $x^3 + a_1 x^2 + a_2 x + a_3 = 0$, and, in general, one of the nth degree has as its type form $x^n + a_1 x^{n-1} + a_2 x^{n-2} + \ldots + a_n = 0$.

Equations are integral or fractional according as the unknown quantity does not or does appear in the denominator of a fraction that has been reduced to lowest terms. Thus $\frac{2}{3}x + 4 = 10$ is an integral equation, while $\frac{2}{x} + 4 = 10$ is a fractional equation in x, as it now stands, although it may be looked upon as an integral equation in $\frac{1}{x}$, and although it may be reduced to an integral equation by multiplying both members by x.

If two or more equations have determinate values of the unknowns, they are said to be simultaneous. For example, $x + y = 12$, $x - y = 2$ are both true for $x = 7$, $y = 5$. On the other hand, $x + y = 12$ and $x + y = 2$ are not simultaneous equations, but are said to be inconsistent.

If an equation contains a term in which a root of the unknown quantity is involved, it is called a radical equation. For example, $\sqrt{x + 4} = x - 2$ is a radical equation which may be reduced to a quadratic equation by squaring both members.

Equations are said to be equivalent if every root of each is a root of the other. For example, $2x = 6$ and $x = 3$ are equivalent equations; but $x = 3$ and $x^2 = 9$ are not equivalent, since the second has a root ($x = -3$) that is not a root of the first. It is readily seen that the axioms of equality do not always lead to equivalent equations. If equals are multiplied by equals, the results are equal; but this does not mean that the results are in general equivalent to the original equations. For example, if $3x = 9$, it is true that $3x^2 = 9x$, but this second equation has a root ($x = 0$) that is not a root of $3x = 9$.

Quadratic equations are classified as complete (affected) and incomplete (pure). A complete or affected quadratic has the type form $a_0x^2 + a_1x + a_2 = 0$ where a is not zero. More simply expressed, the type is $x^2 + a_1x + a_2 = 0$. The English name for this type is adfected quadratic. A pure quadratic equation is of the same type, where a_0 does not equal zero but where a_1 does equal zero. More simply, the type is $x^2 + b = 0$.

A single equation is determinate when it contains only one unknown quantity, and a system of equations is determinate when by elimination it can be reduced to a series of equations, involving the respective unknown quantities, and each containing only the one in question. Otherwise there is not, in general, a sufficient number of conditions to determine the value of the unknown quantities, and the system is then indeterminate. In general, if there are n unknowns and $n - 1$ equations, the system is indeterminate, as in the case of $x + y = 10$, and of the system $x + y + z = 10$, $x + 2y + 3z = 25$.

The ancient Egyptians solved equations of the first and second degree, and the Greeks, usually through the medium of geometry, did the same. (See Algebra.) The greatest algebraist of the Greeks was Diophantus (*q.v.*). The cubic equation was first solved in the sixteenth century by the Italians, the first complete solution being due to Tartaglia (*q.v.*) and being first published by Cardan (*q.v.*) in his *Ars Magna* (1545). The quartic or biquadratic equation was first solved by Ferrari (1522–1565). The general quintic (fifth degree) equation does not admit of solution by the use of algebraic functions. It can be reduced to the form $x^5 + ax + b = 0$, and criteria have been developed for telling under what circumstances such an equation is soluble. That the general quintic could not be solved by algebraic methods was completely proved by Abel early in the nineteenth century.

D. E. S.

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EQUIPMENT OF SCHOOLROOM. — See Apparatus; Desks and Seats; Heating and Ventilation Apparatus; Visual Aids.

EQUIPMENT, ORGANIZATION AND ADMINISTRATION OF PHYSICAL EDUCATION. — See Gymnasium, Equipment of; Physical Education.

ERASMUS (1466–1536). — The best known man of letters of the Northern Renaissance was the son of Gerard of Gouda and Margaret, the daughter of a physician of Zevenberge, whose union was unsupported by the Church. His name, as fully written on the title pages of his works, is Desiderius Erasmus Roterodamus, Desiderius being the Latin equivalent of the Greek Erasmus, and the form Erasmus being the actual name bestowed on the child by Gerard. Erasmus, at nine years of age, entered the famous school of the Church of St. Lebuin at Deventer, under the headmaster Hegius (*q.v.*) and assistant Sintheim (*q.v.*); but

Erasmus in later years writes of the school: "Deventer was a school still in the age of barbarism." In 1480 Erasmus proceeded to the School of the Collationary Brothers (see BRETHREN OF THE COMMON LIFE) at Bois-le-Duc for two years. In 1483 he entered on his novitiate at an Augustinian monastery at Stein near Gouda, where he lived for ten years, and in 1492 he became a priest. In 1493 he was sent by the Bishop of Cambrai to the University of Paris to study theology. There is no doubt that both in the monastery and in the university, Erasmus' chief study was the classics. At Paris he taught Latin, and in 1495 came into contact with English students in Paris, there meeting his future patron, Lord Mountjoy. At this time he wrote his book *De Conscribendis Epistolis*, letter writing being one of the recognized methods of instruction of the time in teaching Latin. In 1499 Erasmus came to England with Lord Mountjoy, and became acquainted with Colet and More. He returned to Paris before the end of the year. In 1502 he went to Louvain, but was back in Paris in 1505. In 1506 he went to Italy, and in 1507 Erasmus joined Aldus at Venice and assisted him in editing the classics. In 1510 Erasmus became Lady Margaret Professor of Divinity, and taught some Greek at Cambridge, where he remained till 1514. From 1514 to 1517 he was traveling. In 1517 the *Collegium Trilingue* was established at Louvain, and Erasmus was consulted as to its organization. In 1519 he settled at Louvain, and here met Juan Luis Vives (*q.v.*). In 1522 he moved to Basel, and spent the rest of his life between Basel and Freiburg in Breisgau. He died in 1536 at Basel. Erasmus was thus a cosmopolitan. But it has been doubted whether he spoke any other modern language than his native Dutch, and it is certain that he usually spoke and wrote in Latin. His editorial services in connection with classical writers included work on Æsop, Ambrose, Aristotle, Arnobius, Athanasius, Augustine, Basil, Cato, Cicero's *De Amicitia*, *De Senectute*, and *Tusculanæ*, *Quæstiones*, Cyprian, Demosthenes, Euripides' *Hecuba* and *Iphigenia*, Jerome and Quintus Curtius. Nor is such a list complete. Still more significant is Erasmus' preparation of what was the *editio princeps* of the Greek text with a Latin translation of the New Testament, called by Erasmus the *Novum Instrumentum*, published at Basel in 1516, though it is probable most of the work in it was done by Erasmus at Cambridge in England. In the preface, Erasmus claims substantially that the Latin Vulgate edition of the Bible must be subjected to criticism the same as the classical authors. Further, Erasmus expresses his wishes that all — "even the weakest woman" — should read the Gospel for themselves. He is thus the first exponent of modern Biblical criticism. Politically, he claims notice by his tract *Querela Pacis*, with its noble protest against war.

Erasmus was a warm friend of Dean Colet and his school of St. Paul, refounded about 1510. He wrote for it some *Carmina*, some verses on the school motto, *Disce aut Discede*, and a *Concio de Puero Jesu*. He also wrote the school textbook *De Copia Verborum et Rerum* (1511). This is a storehouse of rhetorical phrases, which could serve as the very basis for free, ready, and correct Latin composition. *Copia* is the supply of words, phrases, idioms, which gives variability so as to be comprehensive, and with it style so as to leave nothing out in the way of matter, and yet to keep the limit of economy of words. The *Copia* is said to have gone through nearly sixty editions in Erasmus' lifetime, and certainly was not less popular for a century afterwards. The *De Copia* was prescribed by statute for St. Paul's School (1518), though used there before. In 1545–1547 it was used at Saffron Walden Grammar School. It was prescribed in the Statutes of Bury St. Edmunds (? 1550), Retford (1552), Bangor (1568), and in many other English schools. The other great works which may be described as educational textbooks written by Erasmus were the *Adagia* (1st ed., 1500) and the *Apophthegmata* (1532). The *Adagia* in its first form gave about eight hundred proverbs; in its later form five times as many. Proverbs were given in Greek as well as Latin, and the book could thus be used as a Greek textbook. In fact, as Mr. Drummond has said, "besides to a great extent serving the purpose of a dictionary and a grammar, it is a commonplace book, a journal, and a book of travels all in one." The *Apophthegmata*, or *Sayings of the Ancients*, gives little stories of ancient writers (Socrates, Aristippus, Diogenes, Cicero, Demosthenes are drawn upon), with usually some moral deductions giving scope to Erasmus to introduce all kinds of material of his own. In 1519, Erasmus published the *Colloquies*, one of the most widely used schoolbooks of the sixteenth and seventeenth centuries throughout Europe. The University of Paris forbade the use of the book in 1528. It was condemned in 1564 at the Council of Trent. Naturally, in Protestant countries, it was spread broadcast on account of its attacks on monks, abuses, and superstitions. It was required by statute to be taught in many English grammar schools. The subjects are most varied, and are treated by the dialogue method, and, of course, written in Latin. (See COLLOQUIES.)

But, besides positive work for education, Erasmus was particularly strong, a modern Lucian, in his satires on what he considered corrupt and evil. The *Moriæ Encomium* (*Praise of Folly*) (1509) holds up to ironical praise the whole race of monks, scholastic divines, grammarians, and by ridiculing the old order of learning, opened the way for the new ideas of the Renaissance. While it cannot be said that the educational opinions of Erasmus are confined to any one book or number of books, the following among his works deal more specifically with education: the *Enchiridion Militis Christiani* (1501); *De Ratione Studii* (1511); *Institutio Christiani Hominis* (1516), a manual used in St. Paul's School; *Institutio Christiani Principis* (1516); *De Pueris statim ac liberaliter instituendis* (1529). The *De Ratione Studii*, or *On the Right Method of Study* sets forth a plea for the study of language, *i.e.* Greek and Latin, which are complementary and contain "the whole of attainable knowledge"; more attention should be paid to style and content rather than grammar for its own sake. Erasmus then proceeds to suggest methods of teaching in which the capacity of the pupil should be considered and the awakening of intelligence and critical insight should be aimed at. In the *De Pueris statim ac liberaliter instituendis* (*That pupils should straightway from their earliest years be trained in virtue and sound learning*), a treatise addressed to William of Cleves, Erasmus points out the importance of the proper selection of a teacher, and recommends that parents should take a personal interest in the education of their children, for they are begotten to the commonwealth and to God. Education must begin early, and depends on nature, practice, and training; the liberal arts are the handmaidens of conduct; above all love and sympathy for the child, not fear and harshness, should be the stimuli employed. It is in this essay that Erasmus attacks the monastic schools, and insists that it is the duty of State and Church to see that a supply of properly qualified teachers is maintained. The work is one of the best expressions of the humanistic ideal of education by one of its most brilliant representatives who was qualified by experience to speak with some authority.

F. W.

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ERATOSTHENES (275–194 B.C.). — A prominent Greek scholar of the first Alexandrian school. He was a personal friend of Archimedes, and was librarian of the university at Alexandria. He is chiefly known for his work in astronomy and geodesy, determining the obliquity of the ecliptic as 23° 51′ 20″. He also calculated the radius of the earth as the equivalent of about 4600 miles, and the length of a degree as about seventy-nine miles. We are not certain as to the unit of measure used by him, and it is possible that his results were even closer than these. In the theory of numbers he is known for his "sieve," a scheme for sifting out the prime numbers. This plan was frequently given in arithmetics until a generation or so ago. Eratosthenes was also a poet and a general all-round savant. Afflicted by ophthalmia, he committed suicide in 194 B.C.

D. E. S.

ERFURT, UNIVERSITY OF. — The University of Erfurt in Thuringia was established as early as 1392, being the third university to be established within the confines of the present German Empire, Heidelberg having been founded six, and Cologne four years earlier. It attained considerable prominence as a seat of humanism, but suffered greatly during the wars of the Reformation, and was finally disbanded in 1816.

R. T., Jr.

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ERGOGRAPH. — An apparatus for recording the amount of work which an individual can perform under given conditions. The apparatus is generally so constructed as to isolate a small group of muscles and record the number and extent of the contractions which these muscles are capable of making before reaching that state of fatigue where contraction becomes impossible. The original form of the ergograph required the muscles to raise a weight. A later form utilizes a spring instead of weights. The curves derived through the use of the ergograph have been commonly used in discussions of fatigue (*q.v.*).

C. H. J.

Reference: —

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ERIUGENA, JOHN SCOTUS. — An Irish teacher, theologian, philosopher, and poet, who lived in the ninth century. There is now no doubt among scholars as to the birthplace of Eriugena, or, to use the name by which he was known to his contemporaries, John the Scot. He was born in Ireland about the year 820, and presumably was educated in the schools of his native land. About the year 847 he appeared at the court of Charles the Bald, and, as is evident from contemporary references, was received into royal favor and placed at the head of the palace school. At the invitation of his royal patron, he translated into Latin the works of Pseudo-Dionysius. This task had a double effect on his career; by bringing him into prominence in the world of letters, it was the occasion of his entering into the controversy raging around Gottschalk's predestinarian doctrine and at the same time it opened up to him a new philosophical world, that of Neo-Platonism. As a controversialist he wrote the work *De Predestinatione*, and as a Neo-Platonic philosopher he composed the treatise *De Divisione Naturæ*. Besides these writings he left a number of commentaries and glosses, the most important of which are the *Commentary* on Marcianus Capella (*q.v.*) and the glosses on the *Opuscula* of Boethius (*q.v.*). From the last, which were published by Dr. Rand in 1906 (*Johannes Scottus*, Munich, 1906) it appears that he was still alive and in France as late as 867. The date and place of his death are unknown. The legend which tells of his having gone to Oxford at the invitation of Alfred the Great, and the equally legendary account of his death and burial at Malmesbury, are devoid of historical foundation. The works of John the Scot, including his translations, are published by Migne in Vol. CXXII of the *Patrologia Latina*.

Besides being a theologian and philosopher, John the Scot was a teacher and a copyist of manuscripts. As a speculative thinker he ranks very high, his preëminence being all the more noteworthy when one recalls how totally the ninth century was lacking in the spirit of constructive or any other kind of original effort. As a teacher he was one of the group of Irishmen who gathered at Laon and engaged in the study of dialectic, theology, and Greek. The specimens of their work which have survived the wreck of time should not be judged by the standards of modern philology. Considering the age from which they come, they are interesting, and not altogether valueless in the history of classical learning. As a copyist, John the Scot transcribed and glossed a number of school texts, some of which have come down to us in the original autograph. Such, at least, is the opinion of the distinguished palæographer Traube. The mystic elements in John's philosophy and theology had comparatively little influence on his contemporaries. It was not until the first decades of the thirteenth century that the bearing of his pantheistic ideas was recognized and his doctrines formally condemned. His predestinarian doctrines had been condemned during his lifetime at the local councils of Valence (855) and Langres (859). W. T.

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ERK, LUDWIG (1807–1883). — A prominent German composer, born in Wetzlar. In 1826 he received an appointment at the Teachers' Seminary at Mörs, which at that time was under the direction of Diesterweg (*q.v.*). When Diesterweg was called to Berlin, Erk followed him in 1835 as teacher of music of the City Training School, where he remained for the rest of his life. Erk's influence on German schools was especially exerted in the direction of fostering the beautiful and simple German folk songs, and for this he deserves great credit. He published a number of song collections, which became very popular; among them is his *Deutsche Volkslieder* (*German Folk Songs*), Berlin, 1832–1845. F. M.

ERLANGEN, THE ROYAL BAVARIAN FREDERICK-ALEXANDER UNIVERSITY OF. — An institution founded in the year 1745 by the union of an academy, established at Bayreuth in 1742, and a *Ritterakademie*, established at Erlangen in 1699 by Baron Adam Gros von Trockau. The new university possessed the four traditional faculties of theology, law, medicine, and philosophy from the start, but it led a rather precarious existence until given a new lease of life by Margrave Christian Frederick Carl Alexander of Ansbach, who entered upon his activity in 1769, and whose name has been preserved in the designation of the university. The theological faculty was Protestant, the town having attracted a considerable number of French Protestants who had been exiled by the revocation of the Edict of Nantes. In 1806 the principalities of Ansbach and Bayreuth, which had been absorbed by Prussia in 1792, were occupied by the French, and although the university was not discontinued, its income was seriously diminished, and it suffered much hardship. Four years later the principality of Bayreuth became Bavarian, and a new era of progress was ushered in, which was reflected in the better provision made for medical and other scientific institutes and laboratories. The number of students in these subjects increased rapidly during the early eighties, and as a result a number of well-equipped buildings have been erected during the past twenty-five years in order to meet the new demands. Until 1850, the large majority of the student body was enrolled in the faculties of theology and law, but at the present day philosophy and medicine are in the lead, the number of students in the pure science division of the faculty of philosophy particularly showing a considerable gain of late. During the winter semester 1909–1910 there were 1187 students (forty-one women) in attendance, including sixty-four auditors (twenty-two women), the matriculated students being distributed as follows: theology

139, law 247, medicine 294, and philosophy 443. It is thus one of the smallest of the German universities, exceeding only Greifswald and Rostock in point of enrollment. The library contains almost 250,000 volumes and over 2000 Mss. Among renowned teachers may be mentioned Ebrard in theology, Schelling in philosophy, the poet Friedrich Rückert in Oriental languages, and von Raumer in German philology. R. T., Jr.

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ERNESTI, JOHANN AUGUST (1707–1781). — A distinguished German theologian, philologist, and schoolman, one of the leaders of the " New Humanism," was born in Tennstedt, Thuringia, and received his education at Schulpforta and the universities of Wittenberg and Leipzig. In 1731 he became the colleague of Gesner (*q.v.*) at the Thomasschule in Leipzig, and three years later, when Gesner was called to Göttingen, Ernesti succeeded him, and, for a quarter of a century, remained at the head of the school. He also delivered lectures at the university, where, in 1742, he received the regular appointment as Professor of Eloquence. In addition, he accepted the chair of theology in the university (1759), but resigned his position at the Thomasschule. His influence, however, on the higher schools of Saxony, and through them on those of other German states, remained very great. The *Regulations for the Saxon Schools* which he wrote in 1773 were in force for nearly three quarters of a century. He condemned the old methods of teaching the classics, by which it was attempted to give the student merely the ability to write Latin and to imitate the style of Cicero, and insisted on the reading of the ancient authors for the sake of their content and for the cultivation of literary taste and understanding. He laid great emphasis on the teaching of the mother tongue and the reading of the best works of the national literature, as well as on modern foreign languages, history and geography, philosophy and mathematics, including geometry, astronomy, mechanics, and architecture.

About the middle of the eighteenth century classical studies were at a very low ebb in Germany. Through the influence of Gesner and Ernesti and their disciples, however, a new impulse was given to classical learning, and that enthusiasm for antiquity was aroused which is later found in the works of Goethe and Schiller, and which determined the character of the German gymnasium down to the second half of the nineteenth century. Among Ernesti's works the one most used in the schools was his *Initia Doctrinae Solidioris,* 1755, which contains the elements of mathematics, psychology, natural theology, logic, jurisprudence, ethics, politics, and physics, with astronomy and physiology. He published also a number of editions of Greek and Latin authors, besides some theological writings and over a hundred smaller essays and dissertations. Many of these have been collected in his *Opuscula Oratoria* (1762) and *Opuscula Philologica et Critica* (1776). F. M.

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ERNST I, THE PIOUS (1601–1675). — Duke of Saxe-Gotha and Altenburg, the " Pedagogue among Princes," was born in Altenburg, where he received a very careful education under the direction of his mother, Dorothea Maria of Anhalt. Being an ardent adherent of Protestantism, he allied himself in the Thirty Years' War with the Swedes, and fought valiantly, first under Gustavus Adolphus, then under his own brother, the famous Bernhard of Weimar, in the battles of the Lech, Nuremberg, Lützen, and Nordlingen. In 1635 he signed the Peace of Prague, and henceforth he devoted all his efforts to the government of his duchy, the people of which had, in consequence of the terrible war, sunk into a very sad material and moral condition. Through excellent laws and a wise and economic administration, he succeeded in making Gotha one of the most prosperous parts of Germany. His educational reforms were of such a fundamental character that he may be regarded as the real founder of the present common school system of Germany. With the help of Reyher (*q.v.*), a disciple of Ratke and Comenius, he worked out a comprehensive set of school regulations known as the *Schulmethodus* (1642). This code, a pedagogic masterpiece of the seventeenth century, provided for compulsory school attendance and regulated in detail the grading of schools, the courses of study, and the methods of instruction. In addition, the duke caused a number of textbooks to be written by Reyher, and distributed gratis to school children. He raised the salaries of teachers, and instituted a pension fund for their widows and orphans. During his thirty-five years' reign, the intellectual level of his people was raised to such a degree that it used to be said that " Duke Ernst's peasants were better educated than noblemen are anywhere else." F. M.

See Gotha, School Reform in.

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ERNST II, THE WISE, OF GOTHA (1772–1804). — A ruler who, like his ancestor Ernst the Pious (*q.v.*), took a strong interest in education and helped to bring about a revival in his state after the decay and abuses which had crept into school affairs. He assisted Salzmann (*q.v.*) in founding his institution at Schnepfenthal in 1784. In 1780 he established a training school for teachers at Gotha at the head of which he placed Haun (*q.v.*), who was appointed inspector of schools in 1783, and showed great energy and vigor in pressing forward the educational reform.

See GOTHA, SCHOOL REFORM IN.

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BARNARD, H. *American Journal of Education,* Vol. XX.

ERROR OF OBSERVATION. — Common sense usually assumes that there is no evidence so direct, so accurate, and hence so convincing as that given immediately by the senses. However, a comparison of the observations of different persons upon the same object, or of different observations of the same person upon an object which cannot be supposed to have changed in the interim, reveals the fact that the evidence of the senses is full of contradictions, and consequently of errors. The Greek philosophers were for the most part so convinced of this view that they held the senses to yield only error and illusion, and sought in pure reason alone that truth which is free from contradiction. Modern thought, however, has attempted to analyze the causes of errors of observation, and to devise methods by which they may be minimized or eliminated.

In general, the classification and explanation of such errors is a matter of psychology. We do not observe accurately, either because the sense organs do not operate in a perfect way, or because the mental interpretations of sensation are incorrect. The errors due to the defects in our sense organs are various. In general, the sort of sensation that we get depends upon our sense organs, rather than upon the stimulus. A given stimulus will give rise to the sensation peculiar to the sense organ that it affects. If pressure were to affect the retina, we should get light sensation. It follows that if we judge the stimulus to be that which commonly arouses a given sensation, we may be in error. Moreover, certain qualitative, quantitative, and temporal differences and relations our senses may not be able to take account of. For many types of stimulus we have no special sense. Such differences are either lost or rendered imperfectly in terms of other differences that can be perceived. Only the grosser differences in intensity among stimuli can be perceived. Duration and precedence in time are very inaccurately estimated or determined where the amounts are small. Many times a sense organ is stimulated pathologically, as when the ears ring from a cold; or by reaction from other sensations, as in the case of negative after-images of sight, or by association with sensations from other senses, synæsthesia, well illustrated in so-called colored hearing. The estimate of magnitude is largely dependent on kinæsthetic sensations, and many illusions of form, size, etc., are due to the peculiarities in the movements by which the objects are exploited by the sense organs. The mental attitude has much to do with the character of the sensations that we get. Attention determines the clearness of the sensation, and may result in an apparent modification of it. If two objects of the same shape and weight, but of different size, are lifted, the larger one will be felt to be the lighter. We are surprised that it should be so light, and the stress of attention produces the illusion of extreme lightness. Of two contemporaneous incidents, that upon which the attention is fixed is apt to be judged as coming first.

In the case of illusions of mental interpretation, the two types distinguished by Professor James may be noted, — illusions of habit, or apperception, and illusions of expectation, or preperception. Illusions of habit are cases where the habitual interpretation which is given to a sensation happens to be the wrong one. They may be illustrated by Aristotle's illusion of touch. An object placed between crossed fingers appears double, since the surfaces affected could not in the ordinary position of the fingers be touched by the same object at the same time. An illusion of expectation is found in proofreaders' oversights. They see misspelled words, for example, as spelled correctly, because the correct spelling is in the mind. The extreme type of such an illusion is in the hallucination, where apparent sense perceptions are constructed almost, if not quite wholly, out of imagination. Practically all illusions will on analysis reveal elements that will allow of their being classified as illusions of habit or of expectation.

The accuracy of observation increases with training, and so with age. Uncultivated persons show on the whole more imperfections in their observations than do those who have had better advantages. Observations reported after an interval of time are liable to the distortions of an imperfect memory. Suggestions of all sorts may affect such reports, and even the original observation may be affected by suggestion. The suggestion of a lawyer or of the situation may warp the memory of a witness without his realizing it. Children can easily be subjected to suggestions. While, on the one hand, they possess a certain "innocence" of sense, since their minds are not so full of interpretations to apply fallaciously to sensations as are those of adults, on the other, they lack a critical sense by which observations can be rendered exact. Children may easily be persuaded that they smell odors that do not exist. Indeed, such illusions can readily be suggested to adults, especially if their emotions are stirred.

Scientific men, recognizing the liability to errors of observation, have endeavored to take account of them mathematically, so that results might be subject to correction corresponding to known or probable errors. In some cases it is found that observation makes a certain error invariably. Such an inaccuracy is called a constant error. The astronomer's "personal equation" is an example of this. If one is attempting to note the time of an astronomical event, it will seem to come earlier when his attention is fixed more on the clock, and later when he is thinking more of the event itself. This tendency in the individual may be experimentally measured and his observations corrected. Where many observations are made of the same or similar phenomena, and it is noted that there are many differences which can be ranged about a median (see STATISTICAL METHOD), we may suppose that the errors are due to a variety of causes, and that they are distributed as by chance, some in one direction, some in another. In such cases the probable error can be calculated. The chances that the correct observation falls within certain limits are thus stated mathematically. The probable error is a most important factor in determining the reliability of statistical results. E. N. H.

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ERSKINE COLLEGE, DUE WEST, S. C. — A coeducational institution, organized in 1837 as the property of the Associate Reformed Presbyterian Synod of the South. Preparatory and collegiate courses are given. The entrance requirements to the college, which confers degrees, are equivalent to about twelve points of high school work.

ERYSIPELAS. — See CONTAGIOUS DISEASES.

ESPERANTO. — See LANGUAGES, ARTIFICIAL.

ESTABLISHED CHURCH IN EDUCATION. — See CHURCH SCHOOLS; also BISHOPS' SCHOOLS; CANON LAW AND EDUCATION; DISSENTERS AND EDUCATION.

ETHICAL CULTURE SCHOOL, NEW YORK. — An institution which provides instruction from the kindergarten through the high school and maintains a department for the training of kindergarten teachers. It is an outgrowth of the first free kindergarten established in New York (1878) by Felix Adler, the founder of the Ethical Culture Society (1876). The aim of this Society, which now is organized in many cities in the United States, England, Germany, Austria, and Switzerland, is to seek what is good and to promote the moral development of the individual and society. The school was established as a practical experiment to base education on the principles of the Ethical Culture Society. It aims to develop persons competent to readjust this environment in accordance with moral ideals and to impart an enthusiasm for progress which centers in moral relations and the diminution of the evils of the world. Hence emphasis is laid in all departments of the school on direct ethical instruction, as well as all possible indirect moral influences based on social relations between the different classes, for the school tolerates no distinction of race, creed, or social status. The freedom enjoyed by the school has been employed in promoting experiments in the teaching of the different school subjects, especially in English (see FESTIVALS, SCHOOL), in manual arts, in which the school was a pioneer, and in history. Literature, history, and manual arts are closely related with the ethical instruction in promoting the essentially moral aim of the school. A healthy democratic spirit, sympathy between different classes, creeds, and vocations, an appreciation of the evolutionary progress of the world, and a consciousness of the unity of all human beings and human activities are the desired ends of the Ethical Culture School.

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ETHICAL INSTRUCTION. — See MORAL EDUCATION.

ETHICAL TRAINING. — See MORAL EDUCATION.

ETHICS AND EDUCATION. — **Historical and Theoretical Relation of.** — Since good and evil are incident to life, and there are right and wrong ways of attaining good and avoiding evil, there is a natural incentive to morals. It would appear, therefore, that ethics — which is the attempt to give our interest in what is good and bad, right and wrong, the proportions of a science — would be chiefly concerned with the classification of natural goods and the discovery of the most efficient means of securing and disseminating them. But its problems have seldom been so naturally and so simply conceived. Instead of a primary interest in the classification of goods, ethical inquiry has shown much greater interest in such problems as the nature of the good, the relation of the good to the useful, the pleasant, and the desirable, and whether there is one good or many goods. And instead of a primary interest in discovering the most efficient means by which the goods of life may be secured and disseminated, it has shown much greater interest in inquiring about the nature of obligation, the foundation of rights and duties, the extent of responsibility, and the freedom of the will. In other words, there has generally been a "moral" coloring to human reflection on the pursuit of the good, a sense, that is, that men confronted by the consideration of good and right have other and deeper problems than that of means to ends. Thus Plato could picture the perfectly unjust man as one who none the less might have in all quarters the reputation of justice; and Kant could exclaim, "The sight of a being who is not adorned with a single feature of a pure and good will enjoying unbroken prosperity can never give pleasure to an impartial, rational spectator." These illustrations may give one the feeling of what is meant by "moral," a feeling which it is easier to appreciate than to define. An adequate understanding of it can be had only from a study of the general development of moral ideas. This is a large task, and can be treated here only in a summary fashion.

It is customary to claim that ethics first attained something like the dignity of an independent science with the Sophists of ancient Greece (*q.v.*), that is, about the fifth century B.C. The claim may be allowed, provided we remember that it is significant only in view of that particular course of civilization which Europeans and their descendants are wont to regard as the main line of the world's progress. But the beginnings of the science of ethics were naturally not the beginnings of morality. The terms "ethics" and "moral," having, as they do, the primary meaning of the customary and habitual, indicate very clearly that moral philosophy began in reflection on the established customs and habits of the society which produced it. Indeed, if it is usual to begin the history of the science of ethics with the Greeks, it is also usual to begin the history of morals with the rites and ceremonies of primitive peoples, their clan and group customs, their habits of living. It is characteristic of these customs and habits that they are thought to be helpful in promoting the general well-being of the community, and it is apparent that they gradually grew up as organized methods of controlling the forces of nature and the conduct of individuals. Yet it is also apparent that primitive society does not justify them on utilitarian grounds. They have that peculiar sanctity which, as already noted, is called moral, a sanctity which makes them binding even when they are not serviceable, and which steadily opposes change and innovation. Thus in the most primitive societies with which anthropology has made us familiar, we find that individuals are expected to make their conduct conform to customs long established and carefully guarded, and that lack of conformity is severely dealt with. Primitive morals consist thus of organized practices which confine the conduct of individuals within restricted limits, not because these practices have proved to be really serviceable, but because they are felt to be authoritative and obligatory. They determine the training of the young and shape the ideals and practices of education in its beginnings.

See Primitive Society, Education in.

How the practices which constitute primitive morals get that peculiar sanction which is strong enough to outweigh for generations and even centuries the failure to meet the test of genuine serviceableness, is an inquiry of considerable interest and of remarkable difficulty. It is important to note that they have this sanction long before any one thinks of questioning it or discovering reasons for it. As a consequence, it turns out that the reasons savages give for their customs and habits are far from reliable. Even with peoples of considerable civilization, it is usual to find that their established practices are referred back to some early legislator whose personality is largely mythical, or to the revelation of some divinity. All of this goes to show that men have often been more interested in making morals authoritative than in discovering exactly why moral practices are performed. Perhaps we should say, in view of the facts at our command, that these practices get their sanction originally because of their congruity with what we may call primitive imagination. They fitted well into the general picture of things which men rather spontaneously formed, and thus became intimately bound up with their outlook upon life and the world. If this is so, it is perhaps not difficult to understand why the reasons given for their performance after they have become established are so inadequate as explanations of their origin.

It is to be noted also that morals undergo many transformations, and exhibit great variety, quite independent of any marked reflection upon them. Historians have traced with considerable success these variations, and found explanations of them in physical, economic, and social conditions. It is natural to suppose that as these conditions change, the customs and habits of men will change with them. Utility, too, must evidently be an important factor in moral development. For while practices long continue the utility of which is questionable, it is inevitable that these practices tend to break down in proportion as they fail of genuine serviceableness. Thus we may recognize a natural evolution of morals, to a large extent independent of reflective ethical inquiry.

Now, while it would be unwarrantable to claim that there was no such inquiry before the Sophists, or that it was not an important factor in moral development, the general considerations we have noted do, none the less, afford an approximately accurate setting for the reflections of the Sophists. They met a body of established practices sanctified by authority and tradition, marked by many indications of a long history, and of derivation from many contributing sources. The situation which they thus faced they put in question. The incentives to their procedure are doubtless to be found in the social movements of the time; but our concern is with the procedure itself rather than with its causes. We may note, however, that amid all the moral practices of the Greeks which concern the relations of individuals to one another and to society at large, the rights of property, the relation of the sexes, — that general domain which we cover by the terms "rights," "duties," "obligations," — there had grown up the conception of individual virtue or excellence. The Greek imagination had formed a picture of the kind of man it was worth while to be. This picture had found its way into story and drama, but it had also been drawn in terms of moral precepts. The "nothing in excess" and "know thyself," which Plato tells us had been dedicated to Apollo at Delphi as the first-fruits of wisdom, express an idea of balance and intelligence. Wise men like Thales, Solon, and Bias held a place in the popular mind on account of their practical wisdom and their apposite sayings. These conceptions of human excellence do not, however, seem to have advanced much beyond their exhibition in individual character or in proverbial utterance. Even Democritus (460–360 B.C.), who was one of the most conspicuous of Greek thinkers, and who is credited with the production of a work on ethics, seems to have been contented with wise sayings instead of acute analysis. His "golden sayings" are golden, but they do not form an inquiry.

In striking contrast to Demócritus stands his townsman and contemporary, the Sophist Protagoras (480–411 B.C.). He too had a great saying, well known to history: "Man is the measure of all things, of things that are, that they are, and of things that are not, that they are not." That saying is an ethical reflection which is typical of the sophistical movement in its prime. It attempts to cut morals off at once from authority and tradition, and to found human conduct directly upon human nature and man's primary interest in his success and well-being. According to the Sophists, the rules with which men's conduct may be reasonably expected to conform are the rules which are determined by his nature and needs. So the Sophists *taught*. Their great business was education, to free men's minds by a thorough acquaintance with human society and the world in order that human conduct might be freely directed toward the attainable and satisfactory. It is no wonder that they were regarded as the destroyers of tradition, or that they wrought a revolution in education. Since they regarded virtue as the decent equipment of men for life, they made education the indispensable adjunct of morals, and at the same time determined its content and methods in view of the new moral demand. Ethics and education, so far as they indicated intellectual interests, were practically identical.

The relation of Socrates (468–399) to this general movement is ambiguous. He was one with the Sophists in his contention that virtue can be taught, that knowledge and morality go hand in hand, that enlightenment of mind is prerequisite to right action. But history credits him with a violent opposition to the Sophists. It looks to us now as if that opposition may have been rooted more in social and political considerations than in any genuine difference in aim or method. Yet there seems to have marked the teaching of Socrates a profound sense of the ultimate unchangeableness of whatever can be called good and bad, right and wrong, which the Sophists lacked. He seems to have created a passion for discussion and an engaging search for that "real truth inside man" which would both illuminate conduct and satisfy the mind. This he did with an ironic modesty which made that truth forever just beyond one's reach, and yet was so unshakably backed up by a firm belief in that truth's reality that faith instead of skepticism was the result. That justice, temperance, courage, the good, are not things to be changed as suits the opportunity, but thoroughly genuine and changeless, eluding our definitions, perhaps, yet unalterable possessions of the soul — such seems to have been the faith of Greece's greatest talker.

Plato (427–347) had this same faith by temperament, enriched it through companionship with Socrates, and transformed it by his own genius into one of the perduring philosophies of history. If life is to attain the dignity of the best, be the kind of life it ought, it must, according to Plato, involve a vision of the good and express that vision in a realized social order. But vision and expression interplay, for the good is seen not through isolated self-analysis of the soul, but through the perfectibility of social relations which men's natural admiration of the good discloses. There is a kind of analogy between the individual and society, so that the Greek ideal of intelligence and balance in a man is but a reading in smaller letters — the figure is Plato's — of intelligence and balance in the State. Furthermore, intelligence and balance are conceived to be ideals not only of conduct, but also of appreciation, so that the good becomes the concept of every excellence, the beautiful as well as the useful and the true. Plato asks us thus to contemplate a vision of beauty as well as an ideal of conduct and a goal of thought. But the essential thing is that this contemplation must be worked out in social terms, and, when worked out, is seen to disclose the enduring pattern of things which attracts by its own excellence and creates by its own power. Particulars of conduct, things like justice and temperance, which we call the virtues, appeared thus to Plato to be dependent on a whole of excellence, to be its manifold instances, or some relation interwoven with them. One could not be genuinely virtuous in some single direction, but rather more or less virtuous as a whole and as a member of a society which as a whole is more or less virtuous. The good is one. Seldom has history revealed a finer faith in its reality and in its possibilities.

The practical problem set by the philosophy of Plato was the organizing of society in the interest of the ideal it discloses, and this he conceived to be primarily the problem of education. The details of his system we still read with surprise at their boldness, their novelty, and their foresight. They are everywhere joined to an insistent demand, which is both the fundamental characteristic of the Platonic scheme of education and a natural result of his ethical attitude. That demand is that education should aim at individual disinterestedness. So Plato valued more highly the studies we call abstract and speculative than those we call concrete and useful. The latter, he believed, fix attention on the immediately practical and the isolated, and thus, by fostering the desire for individual success, promote the impulses which lead to social disorganization. The former, however, by fixing attention on the impersonal and the general, tend to minimize the purely individual ambitions and desires, give breadth of view, and thus make possible a clearer vision of the social good. Philosophers were to head his State, solely because they are trained to pass disinterested and impersonal judgments upon the affairs of life. To believe that the good as realizable is a social ideal, and to teach with an eye primarily to individual efficiency or success, involved for Plato an insuperable contradiction. That is why the peculiarity of his educational problem is a natural result of his ethical attitude.

The ethics of Plato constitute an important document in the history of education. Wherever we find the insistence that education should equip youth for life by making them broadly disinterested rather than narrowly efficient, by teaching them subjects which make for largeness of mind rather than for practical success, by fixing the attention on something which cannot be measured by worldly accomplishment, there we find the spirit of Plato either directly exerted or arising from some fresh contemplation of social ideals. It has been a dominant spirit in education for centuries, shaping ideals and methods, and begetting that idea of education which we call liberal. (See HUMANISM; LIBERAL EDUCATION.)

Aristotle (384–322) keeps his thinking true to the general conception that the central problem of ethics is to provide an ideal for conduct. But he individualizes the ideal, laying stress, as did Socrates and the Sophists, upon personal attainments. Yet he does not conceive the best possible life as independent of social relations. It must be worked out, if it is to be attained, in the best possible State, but it is primarily a matter of individual perfection rather than of the perfection of society. While Plato could maintain that the individual happiness of citizens is subordinate to the perfection of the State, Aristotle held that the State is at best but an instrument in aid of individual well-being. It is one of the goods of life which, like maturity, health, friends, and property, minister to men's larger capabilities. He thus conceived ethics to be a branch of politics, not because the State comes rationally first as setting an ideal, but naturally first as the environment of human relations and the domain of human activities. Moreover, the ideal is not with him the Platonic pattern of goodness that attracts by its excellence and creates by its power ; it is rather the free exercise of the function or activity which is peculiarly characteristic of man. All things, thinks Aristotle, have their characteristic activities which largely distinguish what they are, and the free exercise of which constitutes the good at which all things aim. The best life for men involves, therefore, the exercise of all their natural activities, but particularly the exercise of that activity by which men are peculiarly distinguished. And this is reason. Now the ideal which reason sets is twofold. It involves the virtuous control of conduct and the free exercise of reflection. Accordingly the ethics of Aristotle comprises an examination of the virtues, those types of excellence which make the admirable man, and also an emphasis on intellectual exercise pursued in its own interest for the self-sustaining joy of it. Thus the perfect man must be not only a citizen possessed of mature powers, abundant wealth, and friends, admirable for his justice, high-mindedness, temperance, and generosity ; he must also be reflective, letting his mind play freely about the concerns of life and the constitution of nature in order that he may attain the supreme excellence of disinterested intelligence. In a sense this is Plato transformed, a faith in an enduring pattern of goodness translated into terms of human psychology and natural science, and presented as a goal of activity rather than as an insight into abiding realities.

This suggested contrast is illustrated in Aristotle's treatment of the virtues. With him they are not partial though related manifestations of a good essentially one and eternal, they are rather organized and controlled tendencies to action in those critical situations where the possibilities of behavior are contrasted and opposite. Thus a man is courageous when he has acquired the settled habit of reacting to danger with his natural tendencies to flight or rashness controlled. He is, as it were, a "mean" between the cowardly and the headstrong. Other virtues are similarly construed. Here again we have the familiar Greek emphasis on balance and intelligence, but it is defined now in terms of the formation of habits. And if the virtues are to be unified, they can become so only as the individual attains a unified control of his habitual reactions in the face of the varied crises of conduct. If this unified control is to be attained, he must carry his conduct up into the domain of reflection, where the bearing of things can be seen and appreciated. "Anybody can give or spend money, but to give it to the right persons, to give the right amount of it, and to give it at the right time and for the right cause and in the right way, this is not what anybody can do, nor is it easy."

With Aristotle the Greek ideal attained its highest expression. Plato beheld it with a finer passion, perhaps, colored by a beauty not quite of this world, and endued with an atmosphere not wholly human. He might have expressed that passion in the words of Sophocles: "O that my lot might lead me in the path of holy innocence of thought and deed, the path which august laws ordain, laws which in the highest heaven had their birth, neither did the race of mortal man beget them, nor shall oblivion ever put them to sleep; the power of God is mighty in them, and groweth not old!" And Plato did say of his perfect State : " In heaven there is laid up a pattern of such a city, and he who desires may behold it, and, beholding, govern himself accordingly. But whether there really is or ever will be such an one is of no importance to him ; for he will act according to the laws of that city and of no other." Aristotle beheld it with a calm confidence untouched by suspicions of its remoteness. For him it was the ideal of the best life attainable by man: best because it embodied the exercise of man's greatest capacities, and attainable because it was grounded in the indications of these capacities themselves, the existence of which guaranteed it without the need of other support.

Greek ethics, beginning with the Sophists and culminating in Aristotle, substituted thus for the current and traditional morals the conception of the best life for man in the light of his natural needs, surroundings, and capacities. Its dominant ideas were balance and intelligence. It was an ideal at once of conduct and of education. Wherever Greek influence went, — and that means throughout Western civilization, — ethical inquiry felt its impression. The conception of the best life, the terms in which it was expressed, the means by which it might be reached, the sanctions which might be urged in its support, — these things might vary, but reflection on morals tended to substitute for traditional practices a conception of the best life, or to suffuse these practices with a sentiment springing from the vision of it. Often these ethical reflections presented an astonishing contrast to the popular morality of the times which produced them; and this contrast has been so heightened by the imagination of many historians that we are wont to think of the centuries which marked the beginnings of the Roman Empire and the spread of Christianity as centuries of moral debauchery, and to regard their ethical ideals as protests wrung from despair. It is saner to think of them in the main as the continuance of the Greek habit of mind. The two ethical philosophies which are regarded as characteristically Roman, the Stoic and the Epicurean, received their initial impulse from Greek thinkers and spread under Greek influence and instruction; Neoplatonism was Plato revived and molding Jewish philosophy; Christianity itself, under Greek influence, came to think of Jesus not only as the Messiah, the bringer of comfort and salvation, but also as the pattern of perfection, the founder of a kingdom wherein membership constituted the best life.

Of all these ethical tendencies, Stoicism (*q.v.*) and Epicureanism have perhaps the best right to rank as ethical philosophies. The ideal of the one, conceived as the resolute will, and of the other, as the sensitive disposition, were grounded in a consideration of man's needs and capacities in view of his surroundings. These ideals have become violently contrasted in men's imagination. The Stoic, as Seneca (4–65), Epictetus (first century A.D.), and Marcus Aurelius (121–180) have pictured him, stands free from the allurements of passion, undaunted by calamity, self-poised, his soul steadfast and resolute to do his part in the world " whether God or atoms rule." The Epicurean, as the fine character of Epicurus (*q.v.*) (341–270 B.C.) himself and the poetry of Lucretius (96–55 B.C.) formed him, is open to the joys of life, his soul attuned and sensitive to the solicitations of happiness, his mind freed from cosmic obligations, since nature, being but matter continually reorganized according to changeless laws, is indifferent to all its products, and yet affords the instruments to happiness, if care is taken to discover and employ them. Contrasted as these ideals are, the one tending toward insensibility and the other toward dissoluteness, they involved an identical discipline, the understanding of human nature and the control of its propensities. Consequently both Stoic and Epicurean could find the aim of education to lie in the development of personality, and value its content and methods as these contributed to that aim.

For the development of ethics Christianity is especially noteworthy for its exaltation of new virtues. Aristotle emphasized such human excellences as wisdom, temperance, courage, justice, high-mindedness, liberality, and friendship. Christianity taught meekness, self-sacrifice, service, charity, mercy, peace, long-suffering, forgiveness, faith, hope, and love. In so teaching, it did more than lengthen the list of the fruits of the spirit. It tended emphatically to alter for reflection the philosophical view of things. The world, in its conception, had become somehow soiled, so that men could not behave toward one another as beings exulting in the pride of life. They faced one another as creatures needing help, consolation, and comfort. They faced, too, a God who would be to them as a father if they, as children, would submit themselves in meekness to his parental care. Thus there has been in the ethics of Christianity the sense that human relations have been determined by an overwhelming calamity which spoiled and debased nature, making it unfit to be a source of inspiration and a sustainer of happiness, putting men rather in desperate need of one another's help and of salvation. There has been, in contrast with this life, the vision of the City of God, on which men should set their affections, and in the radiance of which the joys and toils of the present become insignificant and petty. It afforded an ideal which could comfort and ennoble, but which could also render men insensible to the demands of this life and indifferent to the possibilities of natural goodness. Its training was of the spirit in the paths of peace by the means of grace. So that when Christianity first possessed the world, it did not turn men's minds toward a knowledge and conquest of nature in the interest of human happiness. (See Christian Education.)

Yet the sense of the futility of all things earthly should not be set down as a thing peculiarly Christian. While we are justified in regarding the ethical ideals of the Greco-Roman period as a continuation of the Greek habit of mind rather than as a protest against a widespread depravity in human affairs, we must recognize that they were generally marked by a sad world-weariness. They were so often the ideals of tired men. Various reasons have been assigned for this. Perhaps we find the clew to the matter in the fact that the general imagination was dominated by the idea of imperial conquest, of the restless expansion of the arms and power of Rome. Great victories could arouse great enthusiasms, but those victories tended more and more to be nothing but the subjugation of uncivilized hordes which imposed upon the Roman a burden of administration without contributing to the intellectual life of the time. The greatest energy was spent upon a task which yielded little spiritual reward beyond the consciousness of the successful handling of matters of routine. The conquest of barbarians by Romans afforded none of the great stimuli to creative imagination which marked the robust defense of Greeks against the Persian. The fruits of war were booty and the task of so organizing savage crowds that future trouble might be avoided; they were not the consciousness of a nation saved by its own efforts for its own destiny. The things of the mind were supported by patronage rather than by the quickened intelligence of a people. A multitude that could not amuse itself had to be amused by administrative ingenuity. Life tended more and more to become artificial. It is clear that to Marcus Aurelius, who said that " even in a palace life may be well lived," the survey of imperial possibilities afforded no other prospect than another day of wearisome details, desperately in need of something refreshing, but finding only conventionality for its support. Not that men were generally conscious of such an atmosphere, but that in such they lived, and, breathing it, found it stifling, — if this was so, it is no wonder that men were tired and sought ideals of life which rested the soul, but did not inspire.

The Middle Ages, as we are wont to regard them, were possessed by Christianity, but by Christianity organized and administered by the Church and joined with the Empire in modifying the destinies of Europe. So dominant was that possession, and so frequently has history been written in terms of it, that the remarkable difference between the morals of men in their everyday life and the ideal of the best life as it found expression in the Church is overlooked. That ideal Mr. Bryce has thus described: " A life in the Church, for the Church, through the Church; a life which she blessed in mass at morning and sent to peaceful rest by the vesper hymn; a life which she supported by the constantly recurring stimulus of the sacraments, relieving it by confession, purifying it by penance, admonishing it by the presentation of visible objects for contemplation and worship — this was the life which they of the Middle Ages conceived of as the rightful life of man; it was the actual life of many, the ideal of all." But rarely has there been a time when human relations were marked by so much inhumanity and sordid worldliness, and yet which could own an ideal so unworldly. To that ideal men turned to seek enlightenment and instruction. In the shelter of the Church schools were founded. The teachers were clerics, and even when universities were established, with their characteristic institutional independence, the teachers still for the most part were members of some religious order, whether they taught medicine, law, rhetoric, physics, or theology. The more the learning of the Middle Ages became organized, the more it modified and expanded the ethical ideal. This is seen, for instance, in Abélard (*q.v.*) (1079–1142) and Thomas Aquinas (*q.v.*) (1224–1274). The former, under the title " Know Thyself," treated morality as an independent science based upon the will and conscience; and the latter regarded the State once more as an instrument for human perfection in this life. But most significant, perhaps, is the work of Roger Bacon (*q.v.*) (1214?–1294). Part VII of his *Opus Majus* is a remarkable discussion of moral philosophy. It ends with the exaltation of Christian ideas as supreme; but it discusses civic morality and personal morality in the light of history. On these topics Bacon dwells at length because of " the beauty of the subject and the rarity of the books treating of it." Aristotle is his great authority, but he speaks of his search for Seneca, long unknown to him " and probably to others," and quotes him frequently. He affirms that admirable truths on the subject of personal character and conduct have been set forth by heathen writers, which put Christians to shame. While his work is exceptional, it indicates a new and growing interest in the ethical reflection of the time.

There were also influences independent of the Church which contributed to the enlargement of ethical conceptions. The institution of chivalry, with its ideal of the knight without fear and without reproach, its emphasis on courtesy, gentleness, succor of the oppressed, and respect for women, aroused an admiration of new virtues as embodied in the warrior who was also a gentleman. And such organizations as the Hanseatic League, arising earlier than the thirteenth century, and formed in the interests of safer trade and more intelligent commercial and industrial relations, began to make the demand for ethical recognition in a domain of human activity hitherto almost completely neglected by the moral philosopher. Its noon has been long delayed, but its dawn was early.

It is apparent that modern ethics was not confronted with a dearth of ideals. It possessed the moral philosophies of ancient times, and the heritage of the Middle Ages. Indeed, many a modern book is but a commendation of the long-familiar, a discussion of the best life and of the virtues; and moral education has often been conceived as the study of classical literature. Yet it is not to the rewriting of old themes, however fresh and invigorating, that we should turn for the modern emphasis. It was not for new ideals that modern ethical philosophers searched the scriptures and their own lives, but for a new authority, new methods, and new instruments. The Church ideal, although, as has been noted, there were tendencies in ethics which made for its modification, had acquired during the early years of Christianity and during the Middle Ages a superhuman authority resting upon an institution considered divine. Neither the authority nor the institution endured without challenge. The forces that weakened them — the expansion of men's minds through study, the steady, if slow, growth of a first-hand knowledge of nature, the strife between popes and emperors, the growth of nationalities, the discovery of new parts of the earth — weakened them gradually, but the consciousness that they had been weakened to the point of inadequacy was comparatively abrupt. Francis Bacon (1561–1626), Descartes (1596–1650), and Hobbes (1588–1679) (*qq.v.*), for instance, write with the appreciation of the need of new foundations which is the outcome not merely of a gradual preparation, but also of sudden and revolutionary insight. Francis Bacon may be said to have raised a new ideal, but it was an ideal of the organization of the instruments at men's disposal for the attainment of the best life. These were primarily science, industry, and the arts. Bacon provided for the Church, leaving its authority undisturbed in those directions which science, industry, and the arts do not touch; but for these enterprises he claimed an independent domain, free from authority and tradition and founded squarely upon attainable human experience. Like Plato, he could sketch a perfect State, but in science, industry, and the arts it was founded, and in their interests organized. Descartes, confessing his willingness to submit his opinions to authority, proclaimed under cover of that confession his belief in the equal and natural ability of all men to distinguish between good and bad, true and false, and insisted that what men need in their concerns is not the guidance of authority, but a method for profitably conducting their thoughts and experiences. Hobbes attacked the idea of authority itself, and found it resting ultimately on the mutual consent of men unwilling to trust one another when left to their own natural devices; for the natural condition of mankind is, he thought, a war of every man against every other, and, " which is worst of all, continual fear and danger of violent death; and the life of man solitary, poor, nasty, brutish, and short." Authority, once established, he would have absolute, but he grounded it solely on nature, and justified its existence solely as an institution which makes for peace among men. Work like all this was not the beginning of a new era, but it proclaimed the full consciousness of one. Progress was openly arrayed against tradition, and it has fought a conquering battle ever since. That battle has been stubborn, and is still continued, but to-day it is a commonplace to affirm that authority rests on an accommodation and consent, that method is but organized experience, and that the primary instruments of human welfare are science, industry, and the arts.

The history of modern ethics is the history of the increasing recognition by moral philosophers of these principles. It has been, moreover, a history tangled and confused, for the spirit of modern ethics has never been completely the spirit of the institutions which have possessed the power and resources of modern times. It has had to win resources and power by revolution and compromise. It was thus marked, as we are wont to say, by an intense individualism, since it was the spirit of persons rather than of institutions. Three hundred years after Francis Bacon and Hobbes, an emperor can still claim that he is an instrument of the Lord and not a creature of politics, that he holds his crown by the grace of God, and not by the will of a people or a parliament. Bishops and earls still sit in the House of Lords, not because they are statesmen, but because they are bishops and earls. Impulses toward civic improvement, the remedy of public evils, and the enlargement and betterment of education still find their chief stimuli in individual enterprise or in unofficial organizations. Similar illustrations might be cited from other departments of civilization. They reflect, and perhaps largely by way of reminiscence, how progress has made its way through revolution and compromise. Modern philosophy itself reflects the same picture. Descartes is its accredited father, but he left it a legacy of traditional problems which he himself had inherited, but had not discovered. Indeed, modern philosophy as a whole presents a confused combination of intellectual insight and problems which get their major significance from the fact that men once discussed them. And so, if we consider modern personality, the character of the typical modern man, we find it to be the product of readjustment rather than of singleness of vision. Progress was the spirit of the modern period, but the history of that period is the history of revolution and compromise. This, we may say, was inevitable, but there are indications that we have entered upon a new period where the demands of progress are no longer a call to arms, but the welcome vision of better things.

It was natural that individual moralists of the modern period should reflect its general tendency. Spinoza (1632–1677) is in many respects very typical. His principal contribution to philosophy bears the title *Ethica.* Its fourth book presents a way of life based on a knowledge of the passions of men as these affect human relations and as they can be controlled by reason. It is thoroughly democratic in outlook. In order to attain well-being, he tells us elsewhere (*Tractatus de Intellectus Emendatione*) that it is necessary to understand nature, " and also to form a social order such as is most conducive to the attainment of this character by the greatest number with the least difficulty and danger. We must seek the assistance of moral philosophy and the theory of education ; further, as health is no insignificant means for attaining our end, we must also include the whole science of medicine, and, as many difficult things are by contrivance rendered easy, and we can in this way gain much time and convenience, the science of mechanics must in no way be despised. But, before all things, a means must be devised for improving the understanding and purifying it, as far as may be at the outset, so that it may apprehend things without error, and in the best possible way." All this is conceived in the modern spirit, but Spinoza entitles his fourth book *Human Bondage.* The fifth book is entitled *Human Freedom,* and there Spinoza pictures the best life as a rapturous love of the mind for God, a kind of passionate medieval mysticism. This ideal he grounds in a metaphysical argument concerning substance and attribute, essence and existence, the finite and the infinite, nature and God. His ethics is a compromise between modernity, medievalism, and antiquity. Kant (*q.v.*) (1724–1804), too, is typical. He conceived the moral law to be the principle implied in all reasonable behavior, and thus a basal principle of human nature. But, as if this were inadequate, he finds its own important implications to be God, freedom, and immortality and a " kingdom of ends " which one could never quite reach by enthusiastically trying to improve society. Thus it was that attempts to found ethics upon human nature, human needs, human relationships, and to organize conduct in the interest of progress and a broad view of the possibilities of improving the conditions of life were so frequently turned into attempts to harmonize progress and tradition. Again, we may say this was inevitable, we may say it was wise; but it must be appreciated if we are to understand how modern moral philosophy so often attempted to legitimatize progress, and yet hinted that the best life is attainable without it ; or how the philosophy of Hegel (*q.v.*) was at once a bulwark of tradition and an inspiration to Karl Marx.

It would be inadequate, even in a general sketch, to let modern ethics go solely with this comment upon its dominant characteristic, for it was fertile in ethical problems, in attempts to discover why man is or should be moral. Besides opinions of the types already noted, there were men who looked for some natural sense or feeling or faculty or intuition, back to which could be traced the propensity to pass moral judgments upon conduct. Thus Hume (1711–1776) could appeal to the natural feeling of moral approbation; Adam Smith (1723–1790) to the natural sympathy aroused by an appreciation of the varied situations in which men find themselves; Reid (1710–1796) to a moral faculty ; Kant (1724–1804) and T. H. Green (1836–1882) and their many followers to principles of judgment, native and intuitive; Spencer (1820–1903) to egoistic and altruistic impulses; and the long line of British utilitarians, with such prominent names as Bentham (1748–1832) and John Stuart Mill (1806–1873), (*qq.v.*), to the natural desire for happiness. Such ideas as these were worked out by many, and in a variety of ways. On the continent of Europe they have been generally coupled with philosophical speculation and formalistic classification ; in England with psychological analysis and practical affairs, so that there utilitarianism, with its emphasis upon happiness and the greatest good of the greatest number, has become nationally characteristic.

Particular mention should be made of the work of Henry Sidgwick. His *Methods of Ethics*, first published in 1874 (sixth edition, 1901), is written in the consciousness that the problem of ethics has become a problem in methodology, the ways and means of attaining the best life and the virtues, rather than the discovery of what is good or the foundation and authority of morals. He states in his preface that the work claims to be an examination " of the different methods of obtaining reasoned convictions as to what ought to be done which are to be found — either explicit or implicit — in the moral consciousness of mankind generally: and which, from time, to time, have been developed, either singly or in combination, by individual thinkers, and worked up into the systems now historical. I have avoided the inquiry into the Origin of the Moral Faculty — which has perhaps occupied a disproportionate amount of the attention of modern moralists — by the simple assumption (which seems to be made implicitly in all ethical reasoning) that there is something under any given circumstances which it is right or reasonable to do, and that this may be known. If it be admitted that we now have the faculty of knowing this, it appears to me that the investigation of the historical antecedents of this cognition, and of its relation to other elements of the mind, no more properly belongs to Ethics than the corresponding questions as to the cognition of Space belong to Geometry." Many have thought that the work of Sidgwick utterly ignores the inquiries which give to moral philosophy its chief and characteristic importance; but the historian sees in it the expression of a growing conviction that the best life is naturally disclosed in that prospect of better things which a progressive society envisages, that the virtues are virtues solely because they are types of human excellence historically exhibited and individually attainable in the relations of man to man, and that consequently the only moral *problem* is the concrete and particularized problem of method.

This conviction has in recent years steadily grown in intensity and in general recognition. We may still, however, discover, as in every period of human history we do, a great discrepancy between the habits and customs of men and the moral ideas which their literature and moral philosophy disclose ; but he who reads and he who is engaged in any enterprise for the improvement of human relations can recognize that the primary demand to-day is not for edification, but for enlightenment. The priest still goes to the slums, but there goes with him a demand for more air and more light. Men still carry comfort to sick and wayward souls, but there go with them societies for the prevention of disease, of overcrowding, of poverty, of excessive toil, of the unwise treatment of children, of almost every evil which can distort vision or sap energy. These societies appeal to the public conscience, but they seek to awake it not so much by exhortation as by the concrete exhibition of existing evils and the methods of remedying them. Public officers are *expected* to administer their trusts wisely, not solely because such is their duty, but primarily because they are public officers. In general, virtue is no less desired or esteemed, but vice has become more intolerable. Although revolution and compromise remain in practice, although habits and customs clash with insight and vision, the ethical inquiry of to-day may perhaps claim that it is freeing the conception of progress for singleness of vision. One of the most recent textbooks in ethics (Dewey and Tufts, 1908) closes with these words: —

> "Science will succeed in pointing out the specific causes for many of the moral evils from which we suffer. Poverty, crime, social injustice, breaking down of the family, political corruption, are not all to be accepted simply as 'evils' or 'wickedness' in general. In many cases their amount may be greatly reduced when we understand their specific causes and apply a specific remedy. But the great reliance is upon the primal forces which have brought mankind so far along the line of advance. The constant remaking of values in the search for the genuinely satisfying, the constant forming, criticizing, and reshaping of ideals, the reverence for a larger law of life and a more than individual moral order, the outgoing of sympathy and love, the demand for justice — all these are the forces which have built our present social system, and these must continually reshape it into more adequate expressions of genuine moral life if it is to continue unimpaired or in greater vigor. We do not know in any full sense whence the life of the spirit comes, and we cannot, while standing upon the platform of ethics, predict its future. But if our study has shown anything, it is that the moral *is* a life, not a something ready made and complete once for all. It is the new and serious situations which call out new vigor and lift it to higher levels. Ethical science, tracing this process of growth, has as its aim not to create life — for the life is present already, — but to discover its laws and principles. And this should aid in making its further advance stronger, freer, and more assured because more intelligent."

The aim of this article has not been to write a history of morals or a history of ethical philosophy. It has been rather to sketch the important ethical ideas as they have appeared in history and influenced the minds and educational ideals of men. To trace in detail how modern ethical ideas have affected modern education would involve the writing of the history of that education. For what that history reveals is the growing recognition of the spirit of progress. The steady broadening of the course of study, the slow breaking down of the idea that one type of education is adequate for everybody, the growth of industrial education and vocational training, the carrying of the school to all classes of society and continuously into new fields of activity, the revolution wrought in discipline, the professional training of teachers — such things not only reflect the spirit of modern ethics, but point once more to the close connection which has always existed between moral insight and educational advance. Yet history discloses a steady decline of the importance attached by educators to specifically moral instruction. Even in our colleges and universities the course in ethics has lost the preëminence it once had. This is often regarded as a misfortune, but in the light of history it may be set down as the recognition that the young are taught to be moral not merely by precept and example, but by a lively acquaintance with the specific problems which beset life and by a training in the solution of them. Or it may be set down as the recognition that the study of good and bad, right and wrong, in general, is but one of many ways to strengthen the desire for the good and make known the best ways by which the goods of life may be secured and disseminated. Since the existence of the good and of various means for its attainment constitutes a natural incentive to morals, it may be claimed that there is no specific morality which can be taught.

Academic Status of Ethics. — Since the days of Plato and Aristotle, ethics has been regarded in the general classification of knowledge as a branch of philosophy. It should be remembered, however, that the scope of philosophy has been gradually restricted as special sciences have attained independence of general systems of thought. Yet, great as this restriction has been, ethics has not yet succeeded in establishing itself as an independent science, but remains along with logic, metaphysics, and æsthetics, as one of the parts of philosophy. This fact has determined the place which ethics has held in the general arrangement of college and university studies and its affiliations with other departments of knowledge. Even when it is taught in public schools as a part of general education, its connection with philosophy has been evident. For many years in American colleges a course in ethics, usually known as moral philosophy, was prescribed for all students, and this prescription is still common, although far from as general as formerly. For the advance of ethical inquiry the close identification of ethics with philosophy is not advantageous, for it is evident that any comprehensive appreciation of moral progress can be secured only through acquaintance with general history and with such subjects as economics politics, sociology, and anthropology. The more intimate and increasingly recognized relation of ethics to these subjects will doubtless alter its future status as an academic discipline.

F. J. E. W.

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ETHICS, PROFESSIONAL. — See Professional Ethics; Teaching as a Profession.

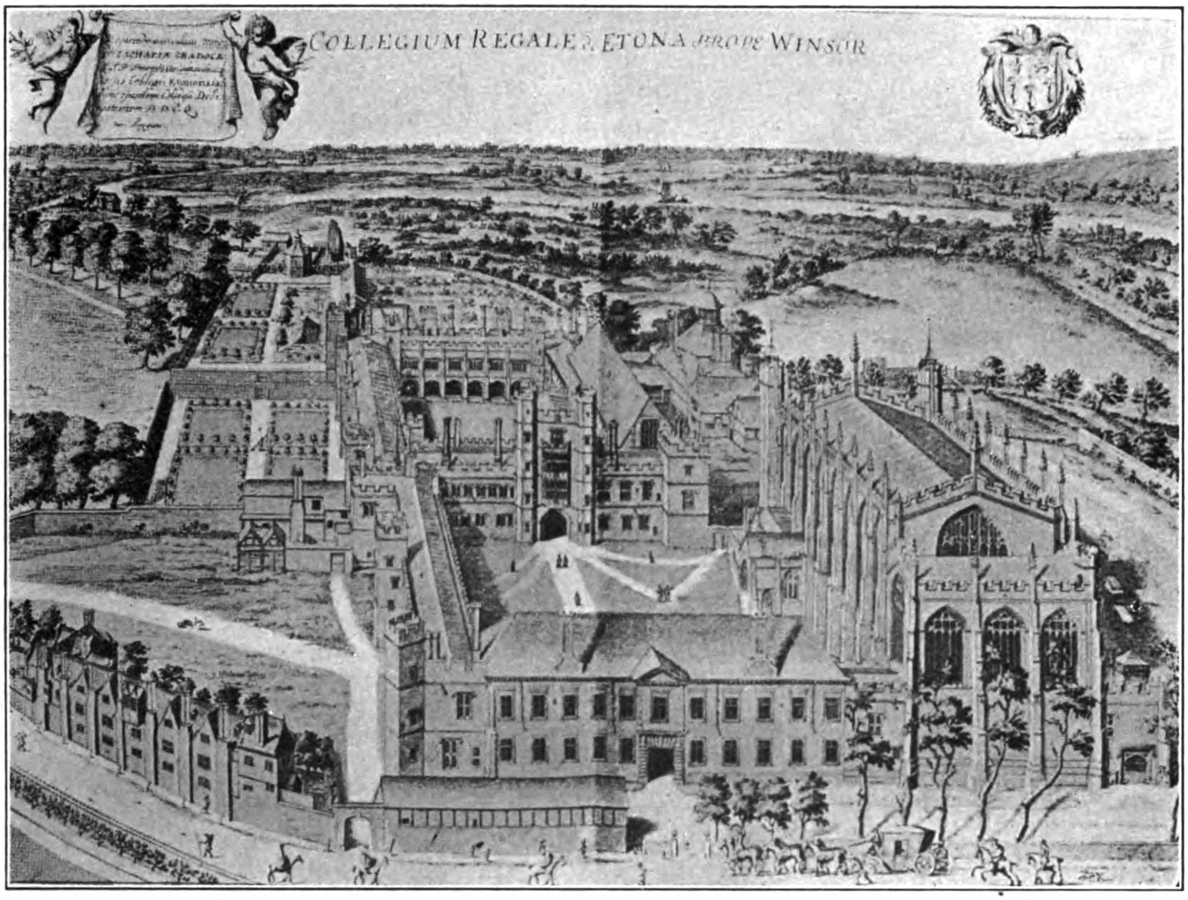
ETHNOLOGY. — See Anthropology.

ETIQUETTE, EDUCATION IN. — See Chivalric Education; Gentry and Nobles, Education of.

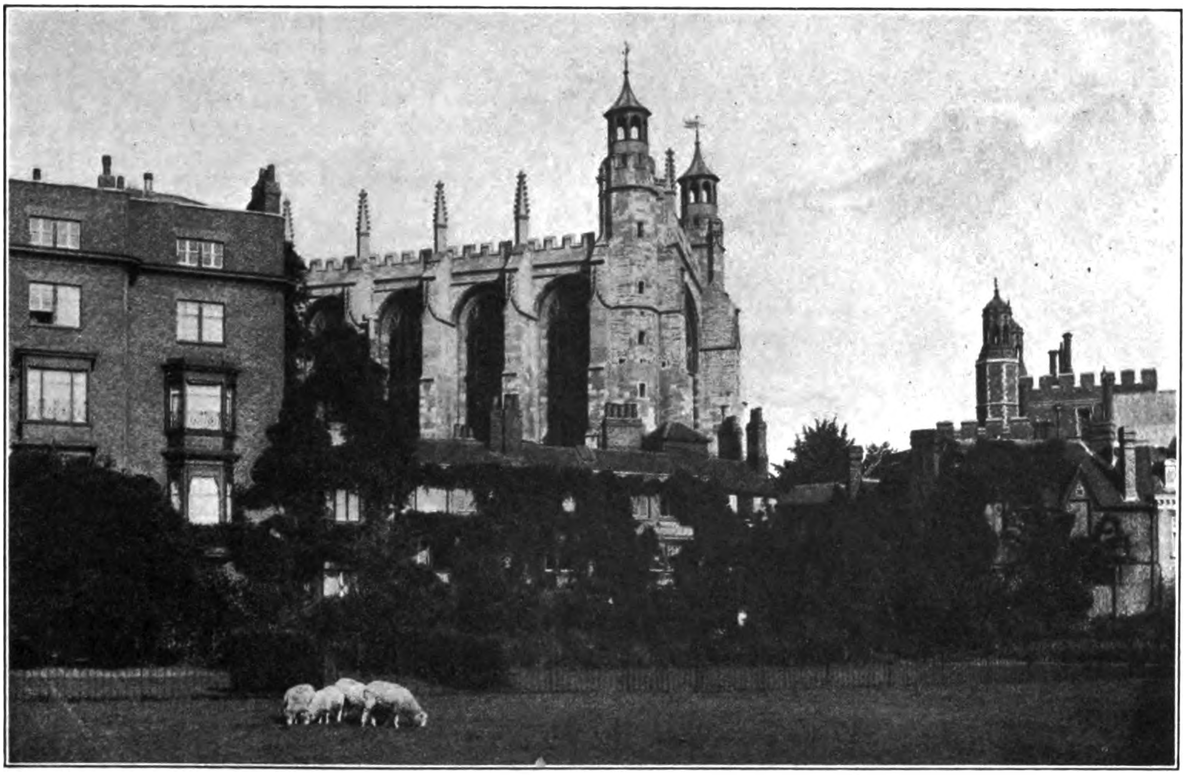
ETON COLLEGE. — The school which was attached to this college, or which formed rather the principal object and end of the college, is probably the greatest alike in size and results which the world has yet seen. In England, while many schools are called royal and dubbed royal foundations, this is the only royal foundation in the full sense. It not only received royal recognition in its title, and in being endowed out of nominally royal, but really public, possessions, but it was actually built with moneys out of the privy purse, and endowed with lands, some of them confiscated to the royal purse, but some also bought out of it by the personal effort and at the personal expense of a king. By letters patent of Oct. 11, 1440, King Henry VI, then eighteen years old, having just taken on himself the government, "as a sort of first-fruits," to "show like his ancestors his devotion to the Church," founded in the parish church of Eton "not far from our birthplace" in Windsor, "the Kings College of Oure Ladye of Eton besyde Wyndesore" to consist of a Provost, ten priests (the fellows), four clerks, "six chorister boys, daily to serve at divine worship, and twenty-five poor and needy scholars to learn grammar there," and "twenty-five poor and disabled men to pray for the souls of his father and mother and all his forefathers and all the faithful departed; also a Master or Informator in grammar to teach the said needy scholars and all others from any part of England coming there, *gratis*, without exaction of money or anything else." The college was licensed to hold property up to the value of 1000 marks (£666, 13*s.* 4*d.*) a year, equivalent to about £20,000 a year now, and the Provost, two fellows, four choristers, two scholars, two clerks, two almsmen were named in the charter. Shortly after, on Feb. 12, 1441, King Henry founded another college at Cambridge University, consisting of a Provost and twelve Scholars or fellows, by the name of the King's College of St. Nicholas, so called because the day of St. Nicholas of Myra, the prototype of the boy-bishop, the patron saint of schoolboys, who is still worshipped by children under the name of Santa Claus, was Dec. 6, the King's birthday. There was in Eton church before 1425 a chantry of St. Nicholas, and it is quite possible that the chantry priest of this church was also, as was common, a grammar schoolmaster. This may have partly suggested the choice of Eton for the site of the college school. There was at first no organic connection between Eton and the Cambridge college. The immediate model of the two colleges was the college school at Higham Ferrers in Northamptonshire and the College of All Souls at Oxford, founded by Henry Chicheley, Archbishop of Canterbury (*q.v.*), Henry's godfather, in 1422 and 1432 respectively. But these were only copies on a smaller scale of the two colleges of St. Mary founded by William of Wykeham, Lord Chancellor of England and Bishop of Winchester at Oxford, then and now called New College, in 1379 and at Winchester in 1382, in which Chicheley had received his own education. Winchester College was the first collegiate church (*q.v.*) in which instead of church services education for boys was made the first object of the corporate body. On Mar. 5, 1440–1441, the first installment of the endowments was given to Eton, chiefly consisting of Alien Priories (*q.v.*). A good many of them had been sold or leased to great persons, and Henry had to buy these to give them to his college as William of Wykeham and Chicheley had done for their colleges. In 1441 Henry visited Winchester to see the working of the school, and as a result, when starting the school at Eton, probably about Michaelmas, 1443, — two years, 1441 to 1443, being employed in building the college and school — he appointed as Provost William Waynflete, who had been headmaster of Winchester for eleven years to Michaelmas, 1441.

Another Winchester scholar, William Westbury, came from New College to be headmaster in 1442. Statutes were made for Eton and the Cambridge college on July 10, 1443, in the same words, with small exceptions, as those for Winchester and New College, and five scholars, one ex-scholar, and one commoner of Winchester were admitted among the first eleven scholars of Eton. So large a part did Winchester play at Eton that the first three provosts, twelve out of the first twenty-five headmasters and eight of the ushers or second masters, and probably a good many more, came from Winchester. The statutes enlarged each college to the same size as Winchester and New College, *i.e.* to a provost and seventy scholars, besides the ten fellows, while at Eton there were also added, in imitation of Winchester, twenty Commoners (*commensales*) who were to be sons of noblemen or special friends of the college, and thirteen outside scholars of the kind known afterwards as servitors, who got their education and board in return for acting as servants to the fellows and headmaster. Henceforth King's College, Cambridge, was to be exclusively manned from the "College Roiall" of Eton, as New College, Oxford, was from Winchester College. Enormous sums were spent, chiefly out of the revenues of the duchy of Lancaster, on building and rebuilding, on an ever-increasing scale, the college, and particularly the church of Eton. But it remained unfinished, when in 1452 the first attack of insanity fell on Henry.

During the Wars of the Roses a great part of the endowment was taken away by Edward IV, and in 1463 by Papal Bull the college was annexed to St. George's, Windsor, and for some four or five years the school ceased. In 1467 it was restored by the efforts of Westbury and Waynflete, then Bishop of Winchester, with Edward IV as founder instead of Henry VI, though since the days of the Tudors Henry VI has been reinstated. The revenues were so diminished that the provost got £30 a year instead of £75, and the headmaster £10 instead of £16, and there were only seven fellows instead of ten. This perhaps hastened rather than retarded the development of the school into a great public school for the upper classes and the aristocracy, who, while paying nothing for their education, as the school was a free grammar school open without tuition fees to all comers, paid large sums for boarding in the houses of the fellows and in the town of Eton, whence they came to be called Oppidans. As at Winchester so at Eton the "poor and needy" scholars were scions from the first of the professional classes and the country gentry, relations of judges and civil servants and well-to-do people, while as early as 1529 Richard Lord Grey of Ruthyn was at the school, prob-


COLLEGIUM REGALE DE ETONA PROPE WINSOR

Loggan's View of Eton College (1688).



By Permission of Spottiswoode & Co., Ltd., Eton College.

Eton College. (From the South.)

ably as a commoner, and a young Paston, of the family of the Paston letters, as an Oppidan (about 1479).

The earliest indication of the number of the Oppidans, who rather than the scholars have made the school famous, is in the will of Provost Lupton, provost from 1504 to 1540. Most of the college buildings and the whole of the great quadrangle except the chapel were built by him or in his time. First came in 1503–1504 " Long Chamber," in which all the seventy scholars slept in one long room, now cut up into separate rooms, and which

> " Contrived a double debt to pay,
> Bedrooms by night and living-rooms by day."

Next, about 1512, a new, now Old or Lower School, in 1515 the chantry on the north side of the church, known as Lupton's chantry, in which he and many later provosts lie buried, and in 1517 the Provost's Lodgings and the great red-brick central tower called Lupton's Tower. By his will, Feb. 23, 1540, Lupton gave "a hundreth children of the town 8*d.* a piece." There is no other indication of numbers till the first extant school list, that for 1678, when there were 207 boys, including the choristers. Only one was a nobleman, the Scotch Earl of Stirling, and there were three baronets. Sir Robert Walpole, the first Etonian Prime Minister, was a colleger, and was on the roll of King's College in 1695. In the next school list, that for 1718, the numbers had risen to 399. The first William Pitt, afterwards Earl of Chatham, was there in 1717. The numbers sank again to 244 in 1745, went up to 498 in 1766, of whom 50 were sons of peers, down to 230 in 1770 after a rebellion in which 156 boys left the school, including a future Prime Minister, William Grenville, who was sent back by his father to be flogged and expelled. In 1836 the numbers stood at 444, while ten years later they were 777, in 1891, 1007, and in 1908, 1045.

Of the curriculum of the school no very definite information is forthcoming before the sixteenth century. But we know that it consisted in the study of the Latin classics and the writing of Latin verses from the record of a payment of 10*d.* in 1474 "for the binding of a school-book, viz. Ovid," and from a letter of William Paston in 1479 in which he gives a specimen of his versifying. In 1486 a school Vergil was recovered which had been furtively taken away, apparently by a dismissed headmaster. In 1528 the " Form order and usage taught in the Grammar School at Eton " was directed to be followed in the free grammar school at Cuckfield, Sussex, enlarged in that year and the " Form " is annexed to the deed of endowment. It gives the curriculum in six classes. The first class learnt Stanbridge's *Latin Grammar Rules* in English, and did "small and easy Latins." The second did Cato's *Moralia*, the third and fourth Terence and Erasmus' *Colloquies*, the fifth and sixth Vergil, Sallust, Horace, and Ovid. They all wrote Latin prose and verse. No Greek is mentioned. But a little earlier the *Vulgaria* of William Horman (*q.v.*), headmaster of Eton 1485–1495 and, after an interval at Winchester as headmaster, 1495–1501, fellow and vice-provost of Eton, published in 1519, give evidence of Greek being taught there; and Sir Thomas Pope, founder of Trinity College, Oxford, writing in 1556, says Greek was taught at Eton when he was a boy there. No Greek occurs in the time-table sent by Dr. Cox, headmaster in 1530, to Saffron Walden School in Essex. Even in the time-table of Malim, headmaster in 1561, Greek grammar was only learned by the two highest forms, VI and VII, and no Greek authors are mentioned. It is not till some notes of Anthony à Wood's, made about 1669, that Demosthenes, Homer, and " Zenophon " appear among the authors read. At that time Greek prose was practiced by translations out of Latin into Greek. In 1765 Dr. James' time-table shows that the Sixth Form translated Homer into Latin verse. Theocritus, Aristophanes, and Greek plays were read. Latin verses were still the chief object. French was taught out of school, as was also drawing. It was not till 1851 that mathematics was made a part of the regular school work, nor till 1869 that natural science was introduced, and the mathematical, science, and French masters were raised to the same status as the classical masters. Under Dr. Warre (1884–1905), the unity of the school was supposed to be preserved by a community of bondage to the Greek Testament, being read by all for one hour every Monday morning. Now, under Dr. Edward Lyttelton, it is possible to be admitted to Eton without " compulsory Greek," and to pass through it with German instead of Greek in the Army Class — a rather recent addition to the school which produced the Duke of Wellington and Earl Roberts in the regular classical mill. The Army Classes number over 100 boys. Classics still predominate, 184 out of the first 240 boys specializing in classics, which now include, however, French, English history, and English literature, as well as mathematics and classics proper.

It was of course a libel when Huxley said that Eton only taught good manners and a gentlemanly proficiency in cricket. It is not even certain whether its cultivation of cricket — to use the word as including games and sports in general — is due to its being the school of the aristocracy, or whether it is the school of the aristocracy because of its cultivation of cricket. It was always to a large extent the school of the court because of the royal patronage extended to it, and its neighborhood to Windsor and to London; but until the second half of the eighteenth century it was less the school of the aristocracy in general than Winchester in the seventeenth or than Westminster in the eighteenth century. It became preeminently the school of the aristocracy because of the beauty of its site, the superiority of its buildings, and the charm of its spacious playing fields, but chiefly because on the whole the boys were much better treated than at other schools. The system of dames' houses had already begun in 1561, when Malim says that there were monitors at each "hostises" (hostess') house "to stop chiding or wrangling and to enforce talking Latin." The houses being of moderate size and kept by ladies, much less barbarism flourished there than in Long Chamber at Eton or at Westminster or the much more barrack-like Commoners at Winchester or "schoolhouse" at Rugby.

As early as 1506 the famous playing fields, playing meads, or playing lees, as they were at first and more properly called, since they were grass meadows and not fields, *i.e.* arable land, occur in the accounts. Before that there was little encouragement of games, and the only forms of exercise were a march out to Montem, later known as Salt Hill, a hill about a mile from the college, with special outings for getting may on May Day and gathering nuts in September. Little of either could be gathered by the school now. About the same time the boys began to perform plays, a Latin play, presented by the master at Christmas, with a little later an English play presented by the usher. From Horman's *Vulgaria* (1519) we gather that the boys learned to swim and play football "with a ball full of wind," quoits,. and tennis. Cricket does not appear before the reign of Elizabeth, and then as a town game at Guilford in Surrey. By Elizabeth's reign Montem had sunk into an annual celebration at which new boys were initiated with actual and Attic salt; and afterwards became a mock-military march at which the salt took the form of guineas, collected from passers-by and those who came to see the fun, for the benefit of the captain of the school, the head colleger. Robert Boyle, "father of chemistry and uncle of the Earl of Cork," when at Eton about 1630, played at tops and ball and was given sweets by the provost. In 1765 cricket, fives, and tennis are the principal games mentioned in the *Nugœ Etonenses* (*Eton Trifles*) of that year. But battledore and shuttlecock, peg-tops, hop-scotch, marbles, hoops, puss-in-the-corner, hunt-the-hare, and chuck-farthing are also mentioned. It is a disputed point incapable of definite solution, whether, when Gray, in his *Ode on a Distant Prospect of Eton College,* written 1742, asks "who chase the rolling circle's speed" he meant who bowls hoops, or who runs after the cricket ball. These "who urge the flying ball" were no doubt the football players. It was not till the nineteenth century that the playing of cricket became a cult and rowing a profession. The former began with the matches against Harrow School, first started in 1822, and against Winchester College in 1826, and still played annually, the latter since 1854 at Winchester and Eton alternately, the former at Lord's Cricket Ground, London. Boating as a profession and not a mere amusement began with races against Westminster School in 1826, and continued till 1848, when the Thames steamboats stopped Westminster rowing. Since then Henley Regatta has been the object of the Eton eight. Though some other schools, such as Bedford, Radley, and to a small extent Winchester and Cheltenham, now row, the Oxford and Cambridge boat race still depends chiefly on which university is, for the time, favored by the Eton oarsmen. At football Eton has two games of its own, "at the Wall," the grand match between Collegers and Oppidans being played on Nov. 30, and the field game, which is one of the elements from which the Association game was developed at Oxford. A Rugby football team and an Association team are now started for some interschool matches. Tennis has disappeared. Rackets reigns in its stead.

But great as the part played by games has been in making the Etonian and the English public school system, it is after all to the excellence of its teaching that Eton has owed its position. Even in the days when Keate (*c.* 1830) pretended to teach 198 boys in one form, the lessons being often interrupted by singing and throwing paper pellets or even stones, the out-of-school teaching by "my tutor" was most efficient for those who chose to learn. Many of the tutors inspired in the boys a far more lasting love of letters and a more effective stimulant than the more ordered and systematic compulsion of class teaching. The names of George Canning, Prime Minister in 1827, the Marquess Wellesley, Governor-General of India, of Gladstone, three times Prime Minister, and Lord Chief Justice Coleridge, as eminent in learning, in the school magazines, and the school debating society, commonly called "pop," as they were in afterlife in the House of Commons or the law courts, are alone enough to show that Eton education was no bad one.

The advertisement thus received from its ten prime ministers, its twenty-two governor-generals of India, and its innumerable cabinet ministers, attracted "the thanes," and the thanes attracted the rest. On the whole, Eton has led and still leads the van of the public schools on its merits. The authorities there have on the whole been more amenable to public opinion and more pervious to new ideas than those of other prominent schools, especially in the domestic life of the boys, but also in the adoption of new subjects and new methods in teaching. A. F. L.

See Dormitories; Grammar Schools, English; Public Schools; Athletics, Educational.

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EUCLID (EUKLEIDES). — The greatest teacher of geometry of ancient times, and the author of one of the world's most influential textbooks. Practically all that is known of his life is given by Proclus (410–485 A.D.) (*q.v.*), who says: "Not much younger than these [Hermotimus of Colophon, and Philippus of Mende, who were pupils of Plato] is Euclid, who composed the *Elements*, collecting many of the theorems of Eudoxus (*q.v.*), perfecting many of those of Theætetus, and also demonstrating with perfect certainty what his predecessors had but insufficiently proved. He flourished in the time of the first Ptolemy, for Archimedes (*q.v.*), who closely followed the first [*i.e.* Ptolemy the First, or Ptolemy Soter], speaks of Euclid. Furthermore it is related that Ptolemy one time demanded of him if there was in geometry no shorter way than that of the *Elements;* to whom he replied that there was no royal road to geometry. He was therefore younger than the pupils of Plato, but older than Eratosthenes and Archimedes ; for the latter were contemporaries with one another, as Eratosthenes somewhere says." Another Greek writer, Stobæus, tells a story that expresses the educational value placed by Euclid upon geometry: 'Someone who had begun to study geometry with Euclid, when he had learned the first theorem, asked, 'But what shall I get by learning these things ?' Euclid called his slave, and said, 'Give him three pence, since he must make gain out of what he learns.' "

From the first of these fragments we gather that Euclid lived after the pupils of Plato (who died in 347 B.C.), and before Archimedes (who was born *c.* 287 B.C.), and in the reign of Ptolemy Soter (who reigned from 306 to 283 B.C.). He must therefore have flourished about 300 B.C. He probably studied at Athens, and certainly taught at the great school of Alexandria, in Egypt. He wrote not merely on geometry, but also on the theory of numbers and other mathematical subjects. It is, however, by his *Elements* that he is chiefly known. Proclus, in speaking of this work, says that there are "in the whole of geometry certain leading theorems, bearing to those which follow the relation of a principle, all-pervading, and furnishing proofs of many properties. Such theorems are called by the name of *elements*, and their function may be compared to that of the letters of the alphabet in relation to language, letters being indeed called by the same name in Greek" (στοιχεῖα, stoicheia). This characterizes the work of Euclid, a collection of the basic propositions of geometry, and chiefly of plane geometry, arranged in logical sequence. Euclid included in plane geometry between 160 and 175 propositions, the manuscripts varying in details. The distinctive feature of his work, compared with modern textbooks, is that he mingles his problems and theorems, endeavoring always to show how a figure is to be constructed before he considers any theorems relating to that figure. We, on the other hand, usually assume the possibility of constructing the figures, until we have a body of theorems upon which the proofs that our constructions are correct can be built. Euclid's treatment of proportion is purely geometric, and is considered too difficult for beginning pupils to-day, being replaced by an algebraic treatment. This modern method is confessedly less mathematically rigorous than the ancient one.

While we have in modern times improved the phraseology of Euclid, simplified the treatment of a few propositions, and made more usable textbooks for beginners, we have not improved upon the rigor of Euclid, nor have we materially changed his basic propositions. Although he was not completely rigorous in all of his steps, he was more nearly so than modern textbook makers, and his geometry is liable to remain for all time as a standard upon which others can improve in details of bookmaking, but upon which no one will greatly improve in the essential features. D. E. S.

See Alexandria, University of.

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EUDOXUS (408–355 B.C.). —A distinguished mathematician of the Athenian school. He was born at Cnidus, studied at Tarentum under the Pythagoreans, went to Egypt with Plato, and finally taught at Athens. To him seems to have been due most of the fifth book of Euclid (*q.v.*), the book that treats of proportion. He was much interested in the theory of the "golden section," the division of a line in extreme and mean ratio. He also perfected the "method of exhaustions" in geometry, which had been suggested by Bryson about 430 B.C. Essentially this means that, in the case of the circle, we may inscribe and circumscribe regular polygons, continually doubling the number of sides, and approaching the circle as a limit, thus exhausting the area between the polygons and the circle. Eudoxus also wrote on astronomy, and his observations were highly esteemed by his successors.

D. E. S.

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EUGENE BIBLE UNIVERSITY, EUGENE, ORE. — A coeducational institution, incorporated in 1895 and offering courses for the training of ministers and the study of the Bible, and maintaining also preparatory, music, and art schools. Part of the studies may be taken at the University of Oregon. The degree of A.B. is given at the end of the four-year classical ministerial course, and a diploma at the end of the three-year English ministerial course. There are twelve instructors on the faculty.

EUGENICS (Greek εὐγενής, "well-born"). — A term modeled after "mathematics," "economics," etc., now the accepted designation of the new science of which the late Sir Francis Galton (*q.v.*) was both father and apostle. Galton first baptized his great idea, as he himself informs us, with the name "stirpiculture," which, fortunately, he abandoned for "eugenics," a word that has found easy lodgment in English and some other European tongues. The matter had been crystallizing in his mind since about 1865, and in 1883 (*Hum. Fac.*, p. 44) he defined the new science thus: "The investigation of human eugenics, that is, of the conditions under which men of a high type are produced"; and for him, somewhat later, "eugenism" expressed "the aggregate of the most favorable conditions for healthy and happy existence." The ideal of "eugenics" was thus the breeding of men of a high type and the creation for them of an environment in which they could live healthily and happily. It is to be regretted that this clear and simple definition of the science could not be preserved in its integrity, although its author harks back to it again and again. In 1904 (*Sociol. Pap.*, 1905, p. 4.) Galton explained eugenics as "the science which deals with all influences that improve the inborn qualities of a race; also with those that develop them to the utmost advantage." A year later (*Sociol. Pap.*, 1906, p. 3) he wrote: "Eugenics may be defined as the science which deals with those social agencies that influence mentally or physically the racial qualities of future generations." The *Eugenics Review*, the organ of the Eugenics Education Society, has as a motto a somewhat different definition: "Eugenics is the study of agencies under social control that may improve or impair the racial qualities of future generations either physically or mentally"; and the motto of the Francis Galton Laboratory for National Eugenics at the University of London defines "national eugenics" in just the same words. The popularity of eugenics has been, until lately, of rather slow growth. Indeed, it is a curious fact that not until some of its devotees had, in some way or other, touched the keys of nationalism and of race, did it take seriously in certain quarters. The scare of "race-deterioration," so largely a myth, but propagated skilfully by the militarists, resulted in a boom for the new science, the declared object of which was the production of men better constituted physically in particular, and, therefore, better food for powder. A decrease, *e.g.* in the average height of recruits, which may be in itself no bad thing at all, but an actual advantage evolutionally, and the "alarming frequency" of alleged "stigmata of degeneration," that disqualified men for military service, but did not seriously unfit them for pursuing the more necessary and more satisfying arts and activities of peaceful life, were made the most of, and eugenics gained thereby in vogue, if it lost in fidelity to the real principles of human evolution. Thus in Britain, as in Germany, "national eugenics" and "racial eugenics" were born and baptized with much less than an omnihuman blessing. "Anglo-Saxon eugenics," too, is not unheard of. In this way eugenics has taken on a patriotic instead of an anthropological color in some places, and its aim is not so much the production of men of a high type as it is the physical betterment of youth annually sacrificed to the god of war. It is fair to say, however, that many eugenists, like President Jordan, of Leland Stanford University, are outspoken in their denunciation of the folly of civilization in thus sending its best blood to destruction. Eugenics in the service of war is a travesty upon human intelligence; it is the victories of peace, "no less renowned than war," with which eugenics must be in eternal alliance. The generic condition of mankind is peace, not war; and eugenics is a generic science.

The eugenic idea *per se* is nothing new in the world. What is new about it, or, rather, what has yet to be added, is its humanization, for, even in our own day, it smacks too much of the stud. Theognis of Megara, the protagonist of the Dorian aristocracy of the middle of the sixth century, B.C., in a poem addressed to young Cyrnus, wondered that horses and cattle were so finely and men and women so poorly bred; and, two centuries later, Plato, the great Greek philosopher, in his *Republic*, sketched a "proto-eugenic" system, which, happily, stands no chance of ever being adopted by any sane community of human beings, — the distance some of the Greek peoples went in the direction indicated by him accounting, doubtless, in part at least, for the subsequent extinction or degeneration of the Hellenic race. Nor has eugenics been confined altogether to the civilized sections of mankind. Mr. A. E. Crawley (*Eugen. Rev.*, Vol. I, pp. 275–280) has called attention to " primitive eugenics," as exemplified, *e.g.* among the Fijians, the Australian Blacks, etc., where artificial methods, in the form of taboos and the like, "favor the best results for birth and rearing." This is in addition to the " natural sexual selection " (not promiscuity) in vogue, which makes for the best unions. Of the general environment of savagery, Mr. Crawley remarks, " the only drawback to its eugenic perfection is a certain irregularity about meals." Out of this eugenic Garden of Eden man has banished himself by adopting the artificial instead of the natural life. Mr. J. G. Frazer, in a recent monumental work on primitive sociology in certain of its most remarkable aspects (*Totemism and Exogamy*, 1910, Vol. IV, pp..109, 168), emphasizes the existence among savage peoples of " artificial methods deliberately devised for preventing the marriage of near kin." He does not hesitate to say that exogamy, " in the form in which it is practiced by the lowest of existing savages, the aborigines of Australia, presents a curious analogy to a system of scientific breeding." These savages, he thinks, " egregiously wrong in theory," but "fundamentally right in practice," really present " an unconscious mimicry of science." The ends accomplished were wise, even if the thoughts of the men who initiated the devices employed were very foolish. Such things almost make one believe that occasionally men ignorantly but successfully get into touch with the guiding currents of the life process itself. Evidently " national eugenics " has not a little to learn from " primitive eugenics." This is especially true, when one considers the safeguards thrown about the pregnant woman and the woman who has been recently a mother by savage and barbarous peoples all over the globe. Rights and privileges which modern legislators still hesitate to confer upon her are there her portion by immutable public opinion. Here, as so often in other matters, an unspoiled primitive people reflects better the essential morality and justice of mankind than does a Greek philosopher, *blasé* even at his early stage of the world's history.

It was quite natural that England, where class and heredity still count for so much in society and in political institutions, should be the modern vitalizer of the eugenic idea; and as natural also that democratic America should be inclined to criticize before accepting its dogmas. Galton, " the father of eugenics," illustrated admirably his science, for he was, indeed, well-born, — cousin of the immortal Charles Darwin, who was himself the child of a cousin-marriage. In a sense, he " recapitulated " eugenics. Rarely in human history has it occurred that the founder of a new science, himself a man of genius, has been the close kin of men of genius. Moreover, Galton was very fortunate in associating himself with Professor Karl Pearson, whose " mathematical contributions to the theory of evolution " have made him justly famous. The combination of Galton and Pearson does not often occur at the birth or the beginning of the propagation of a new idea. And, beside all this, like Darwin, Galton did not belong to the academic proletariat, but was able to a considerable extent to finance his reform. It was from his pocket that the salaries of the Research Fellow and the Research Scholar in the Eugenics Laboratory at the University of London came, and his bounty was evident in other directions as well. Facilities for the publication of results of investigations along eugenic lines and in allied fields of research have been provided, such as *The Eugenics Review*, *Biometrika*, the various monographs issued from the Laboratory of Eugenics, etc. By will Galton left the chief portion of his fortune to establish a chair of eugenics in the University of London, the first occupant of which is to be Dr Karl Pearson. A Eugenics Education Society has been founded, whose objects are declared to be as follows: (1) Persistently to set forth the national importance of eugenics in order to modify public opinion and create a sense of responsibility in the respect of bringing all matters pertaining to human parenthood under the domination of eugenic ideals. (2) To spread a knowledge of the laws of heredity so far as they are surely known, and so far as that knowledge might affect the improvement of the race. (3) To further eugenic teaching at home, in the schools, and elsewhere. In Germany, the corresponding society is *Die Internationale Gesellschaft für Rassen-Hygiene*, whose members among many other things conducing to eugenism, " agree that, before entering on marriage, they will submit to a medical examination as to their fitness for the marriage state, and, if pronounced unfit, will abstain from marriage, or, at all events, from parenthood " (*Eug. Rev.*, Vol. II, p. 91). The German periodical concerned with eugenics is the *Archiv für Rassen- und Gesellschafts-Biologie*. The American Breeders' Association (founded in 1903) has now a eugenic section devoted to the human aspects of breeding. Under the auspices of this section subcommittees of experts are now engaged in the investigation of the feeble-minded and insane, while others yet to be constituted will study deaf-mutism, eye-defects, etc., from the eugenic point of view. Much " pre-eugenic " work has been done in America in connection with personal purity " campaigns," the " Indiana movement," and other efforts to combat alcoholism, the " social evil," syphilis, etc., but eugenics itself is broader and deeper than all these efforts at social and individual " reform," and cannot act as the mere subsidiary of race, sect, class, or the like. Naturally, in America, emphasis has been laid upon environment. Davenport (*Eugenics*, 1910) tends to ignore the controversy between heredity and environment in practical eugenics; and Burbank, looking upon heredity as "stored environment" (*Training of the Human Plant*, 1907, p. 88) considers that "in child-rearing environment is equally essential with heredity," a view that departs far from the opinions of some of the British eugenists. It is an American, too, Mrs. E. H. Richards, who has provided the name for the science of the eugenic environment. Her book, *Euthenics, the science of controllable environment* (1910) treats of "the betterment of living conditions through conscious endeavor for the purpose of securing efficient human beings." The remarkable power of environment, as revealed everywhere in America will make it difficult for the advocates of "social surgery" to secure the enactment of their more radical legislation, although sterilization of the unfit, so warmly advocated by so distinguished a British eugenist as Havelock Ellis, and already in vogue in parts of Switzerland, in the state of Indiana, and is approved by many American physicians and others. Legal infanticide and voluntary destruction of the weak, abnormal, etc., have not yet won popular approval. Dr. F. A. Woods, however (*Pop. Sci. Mo.*, 1910), has called attention to "the laws of diminishing environmental influence," and "diminished value of modification as evolution proceeds." This would apply especially to human psychic phenomena. Burbank and others would keep children out of school till after the tenth year. Sir Francis Galton, himself, and other prominent eugenists have been careful to disavow any sympathy with the idea of creating by a *coup d'état* "eugenic state" on the Platonic model. Mr. F. C. S. Schiller (*Eug. Rev.*, Vol. II, p. 16) condemns Plato's *Republic* as "hopelessly impossible." Plato's proposed state regulation of marriage with official "ballot-stuffing" in the process of mating by lot to the advantage of "superior persons of each sex," and legal infanticide for the offspring of "inferior parents," is so thoroughly unevolutional in its character that science must always relegate it with other chimeras to the lumber pile of impracticable as well as unhuman "reforms." But Plato was not content with this alone, for his scheme involved also a more than Nietzschean disregard of mother love and the destruction of the sense for the child in the individual parent, as well as the abolition of the whole individual family life. In the mind of the great philosopher (if he really believed in his own plan, which, we may charitably think, is doubtful), "conscious parenthood" found no place. Here is where modern must differ from Platonic eugenics. Galton, himself (*Memories*, 1908, p. 311), noting that "the most common misrepresentations now are that its methods must be altogether those of compulsory unions, as in breeding animals," expresses the view that, while forcible interference with the propagation of the unfit and the constant introduction of degenerate stock is not inconsistent with democratic theory, and may come in course of time, compulsory marriage is an entirely different thing, the ethical justification of which, as well as the scientific, is yet absolutely without proof. The very title of Dr. Saleeby's book, *Parenthood and Race-Culture*, shows where he stands upon certain questions. Eugenics, as the science of breeding for posterity, must have parenthood as its ideal, reverence for motherhood and reverence for fatherhood; the determination that those who are to live the "good life" shall be born of good stock into a good environment. This means infinitely more than the "stud-farm" or the "social surgery" theory of eugenics. An eminently sane view of practical eugenics obtains with such American writers and investigators as Professor Davenport, whose little book should be read by every one desirous of knowing the relationship of eugenics to biology, and of finding out, so far as is now discovered, what things may and what may not be bred into or out of human beings. Both in Europe and in America, eugenics is in process of being humanized. The preservation of the family (eugamy) must form a part of what has been called the "chivalry" of eugenics. All eugenic proposals that would injure ultimately its integrity are in themselves non-eugenic and unevolutional, for whatever relationships may elsewhere obtain, in this sphere of activity "man is man, and beast is beast." The ultimate *eubiosis* must be thoroughly human.

In various parts of the world, the eugenic "campaign" is interfered with, or modified by, the prevalence of certain more or less local phenomena. Such, *e.g.* are in England "the race deterioration scare," already referred to, and the "new woman" movement; in France the low birth-rate; in Germany the educated proletariat; in parts of Scandinavia the low marriage rate; in the Latin countries the existence of multitudes of celibates of both sexes connected with the Church; in English America, the divorce problem and the "race suicide" question. Considered evolutionally, however, most of these complications are of a temporary or a merely incidental nature, and eugenics, rightly understood, has nothing to fear from them in the long run This is particularly true of so-called "race suicide" in America, as Phillips (*Univ. of Col. Studies*, Vol. VII, 1909-1910.) has recently pointed out in his very interesting discussion of this topic about which certain great Americans have worried so much. And in England Dr. Saleeby believes the low birth-rate a sign of progress rather than otherwise.

In their "eugenic program" the various peoples of the world differ, and will perhaps differ for a long time; and when such new and powerful peoples in the sphere of human activities in the large as the Japanese, Chinese, etc., begin in earnest real eugenic labors, it is reasonable to suppose that new contributions of great value will be made by them to the science of breeding men and women of a high type, not to say in the processes by which their healthy and happy existence will be assured and sustained. In certain countries of Europe, Switzerland and France in particular, the endowment of motherhood and fatherhood and the taxing of bachelordom are in great favor. Mothers are allowed leave of absence during childbed, without loss of pay, when they are school teachers, government or municipal officials, etc., and in some places officials who at the age of twenty-five or twenty-nine are still unmarried are compelled to forfeit their positions, while those in civil life have a double military duty to face. This is in marked contrast with English America, where marriage is a reason for exclusion from college, as also from the ranks of the teaching profession (for women) in most parts of the country, while it is not uncommon for presidents of educational institutions to proclaim themselves loudly as eugenists or opponents of "race suicide," although in the faculties of their universities or colleges absolutely no distinction in the matter of salary, even in hard times, is made between " the bachelor without encumbrances " and " the man with a family." And the institutions of highest rank, devoted to research, are seemingly the worst offenders. Science has yet to recognize the family.

Naturally enough, the young science of eugenics has had to quarrel with some of the older and more strenuous or more popular theories and speculations of the age, and to make its alliances and combinations with others of these. And sometimes it has suffered more at the hands of its friends than at those of its foes. All Darwinians, Lamarckians, Mendelians, De Vriesians, — the many varieties of evolutionists, mutationists, etc., — have not seen eugenics with the same eye, nor have they been equally cordial in welcoming or equally zealous in rejecting it. Galton, himself, healthily anti-Nietzschean, sums up the matter on this point in these words (*Memories*, p. 323): " Man is gifted with pity and other kindly feelings; he has also the power of preventing many kinds of suffering. I conceive it to fall well within his province to replace natural selection by other processes that are more merciful and not less effective. This is precisely the aim of eugenics. Its first object is to check the birth rate of the unfit, instead of allowing them to come into being, though doomed in large numbers to perish prematurely. The second object is the improvement of the race by furthering the productivity of the fit by early marriages and healthful rearing of their children. Natural selection rests upon excessive production and wholesale destruction; eugenics on bringing no more individuals into the world than can be properly cared for, and those only of the best stock." Eugenics, moreover, in that it cares for both the individual and the nation, has the virtues of both charity (in the true sense) and statesmanship. It is both ideal and practical, humane and human.

The disputes concerning the nature and mechanism of heredity, the possibility of the inheritance of acquired characters, etc., have sometimes been lively, even within the eugenic group of scientists themselves. Galton and Pearson, the former from his studies of men of genius and their relationships, the latter from his statistical investigations, etc., are partisans of heredity, going almost as far as the American Dr. Woods, who maintains (*Pop. Sci. Mo.*, April, 1910) that " experimentally and statistically there is not a grain of proof that ordinarily environment can alter the *salient mental and moral traits* in any measurable degree from what they were predetermined to be through innate influences." Both have recently objected to the quite absurd idea that the British House of Lords and the hereditary nobility of the Empire were object lessons in eugenics (*Eug. Rev.*, Vol. II, pp. 3, 84). Heredity by no means necessarily implies primogeniture; in fact, it almost appears to point a little in the direction of gavelkind. Both Sir Francis Galton and Professor Pearson are convinced, as the result of numerous researches carried on by themselves, or more or less under their direction, that with respect to tuberculosis, insanity, crime, and possibly certain other things, there is " a pathological weighting of elder children," which would call into doubt alike the institution of the small family and the selection of the first born for hereditary positions. Selection from all the children would here be the truly hereditary and eugenic process. One of the common beliefs of generations past that " clergymen's sons go to the devil," or are, at least, very inferior individuals, has been proved false through the investigations of Welldon, even if the later studies of Schuster on the promise of youth and the performance of manhood have shown that " there is reason to suppose that the bar is a profession which attracts abler men than does the church." Professor Pearson thinks his numerous and extensive investigations indicate that " the mental characters in man are inherited in precisely the same manner as the physical," and that " our mental and moral nature is, quite as much as our physical nature, the outcome of hereditary factors." Interesting data furnished by the eugenic school are the studies of correlation between mental and physical characters and between mental and moral attributes, etc. Some of the results obtained merely confirm or refute, as the case may be, old folk thoughts or " guesses at truth "; some others are still of very doubtful validity. A fair criticism of some of the studies of Pearson is made by Bateson (*Proc. Roy. Soc., Lond.*, 1901), who says that they have to do " with normality rather than with evolution."

The results of Mr. Heron's researches concerning the influence of defective physique and unfavorable home environment on the intelligence of school children are rather surprising. It was found " impossible to assert that defective intelligence has largely its source in unfavorable home environment or in defective physique," and that " home environment, as measured by clothing, cleanliness, nutrition, stature, and weight, cannot be the chief determining cause of the differentiation of intelligence; nor is defective physique the cause." Even more remarkable are the results of the Elderton-Pearson study of the influence of parental alcoholism on the physique and intelligence of the offspring, in accordance with which very slight traces of deleterious influences are perceptible, and a considerable number of cases must rather be counted in favor of the alcoholic parent. This curious result certainly needs reinvestigation. It will be noticed that many of the studies of the British eugenists are as decidedly in favor of " nature " as are corresponding investigations in America (see Criminality in Children) in favor of environment. The cousin-marriage question (the results of Huth's and Sir G. Darwin's investigations as to the harmlessness of such alliances between thoroughly healthy individuals of healthy stock have never been seriously attacked) has been made more interesting by the data obtained in Fiji by Thomson (see *Eug. Rev.*, Vol. I, p. 279). Among this fine, healthy race, " habitually marrying their first cousins," no evil effects are discoverable (and they outrank the natives of other parts of Fiji where the practice of such marriages is not in vogue), and it appears that the children of parents whose parents were brother and sister have advantages over those of parents whose parents were the offspring of two brothers or two sisters respectively.

The question as to the proper social atmosphere for the eugenic idea is one which all eugenists are not agreed on. Some, like Herbert, wish to tie it up to socialism, believing that " the socialistic state " is the only one in which it can ever attain any sort of perfection; others, like Whetham, confess a secret belief that " eugenics would best be furthered by an enlightened and aristocratic toryism." Others, again, with Mügge, express the opinion that the fit thing to do is to marry " the eugenic science," discovered by Galton, to " the eugenic religion," promulgated by Nietzsche, and thus make certain the breed of the superman (or rather the overman). Not a few are mightily disturbed about the coming of the woman, and are altogether fearful of its effects upon " man, who is, after all, more important than woman in the history of mankind." There are eugenists also who are not quite sure but that eugenics may after all turn out to be a sort of device of " nurture " instead of " nature," injurious in reality to the great selective forces of nature, interference with which on the part of man tends to be so calamitous. They will not go as far as Archdall Reid in watching cold-bloodedly the weeding out of the weak, nor will they, on the other hand, with Dr. Saleeby, attribute so much virtue to the elimination of the " race poisons " to which millions are sacrificed every year.

There are eugenists who scoff at love as a mere frailty of many human beings, and they have left it out of account in the pros and cons of eugenics. But love, who laughs still at locksmiths and has done so from time immemorial, is not to be disposed of so easily. Galton is much wiser than some of his disciples, and has felt the force of the argument that humanity would hardly be likely to decree the death of the finest product of the long line of sentient development from the protozoa to the conception of God himself. He has made it clear that he entertains no such delusion, for he says (*Sociol. Papers*, 1906, p. 51): "I regret that I did not express the distinction that ought to have been made between the two stages, that of slight inclination and that of falling thoroughly into love, for it is the first of these rather than the second that I hope the popular feeling of the future will successfully resist." If eugenics can always retain a sense of the divinity of the greatest human passion, and sustain the test of Shakespeare's immortal dictum, all may, perhaps, be well. A. F. C.

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The increasingly large literature of eugenics is well represented in the various periodical writings of Galton, Pearson, Heron, Lee, Elderton, Saleeby, Whetham, Schuster, Nott, Poulton, Sullivan, Schallmeyer, Tayler, Wilson, Woods, Davenport, Jordan, etc., in the *Publications of the Eugenics Education Society, The Eugenics Review, Biometrika, Eugenics Laboratory Memoirs and other Publications, Drapers' Company Research Memoirs, Sociological Papers, Sociological Review, Journal and Transactions of the Royal Society of London, Journal of Genetics, Popular Science Monthly, Archiv für Rassen und Gesellschaftsbiologie*, etc. The following special researches, studies, and essays may be also referred to: —

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THOMSON, J. A. *Darwinism and Human Life.* (London, 1910.)
WHETHAM, W. C. D. and C. D. *The Family and the Nation; a Study of Natural Inheritance and Social Responsibility.* (London, 1909.)
WOODS, F. A. *Mental and Moral Heredity in Royalty.* (New York, 1906), etc.

EULER, CARL PHILIPP (1828–1901). — A prominent German teacher of physical training; was born at Kirchenbollenbach, near Trier, Rhine Province, and studied philology and history at the universities of Bonn and Berlin. In 1852 he took the course for the training of teachers of gymnastics in the Royal *Zentral-Turnanstalt* under Captain Rothstein (*q.v.*), devoting himself especially to the study of anatomy and physiology, which he considered indispensable for the teaching of gymnastics. In 1854 he was called to the famous school of Schulpforta to teach languages and history, as well as gymnastics, fencing, and swimming. He succeeded in imbuing with the love of physical exercise not only the students, but also the younger teachers of the institution. His reputation soon earned for him a call to the *Zentral-Turnanstalt* in Berlin (1860), where he became involved in a controversy with the director of the institution, Captain Rothstein (the so-called *Barren-Streit*). Rothstein, an admirer of the Swedish system of gymnastics, removed from the gymnasium all horizontal and parallel bars, as well as other apparatus commonly used by German teachers, on the ground that the exercises on these apparatus were unhygienic. Euler opposed this attack on the German system, and the matter created such widespread attention that it was brought up in the Prussian legislature, where the famous physiologist Du Bois Reymond (*q.v.*) championed the cause of the native school of gymnastics against the Swedish system. Finally the controversy was decided in favor of Euler by an expert opinion given by the highest medical authority in Prussia.

Besides teaching in the *Zentral-Turnanstalt*, Euler directed the physical instruction in a number of other schools, such as the Joachimsthal Gymnasium, the Wilhelm Gymnasium, and the Royal Female Teachers' Seminary. He did much for the introduction of physical training for girls and for the instruction in swimming. From 1865 on he was sent by the government on annual tours of inspection to report on the condition of the teaching of gymnastics in the various Prussian provinces. In 1892 he was made a *Royal School Councilor*, and in 1901 he died in Berlin. Euler's literary activity, especially in the field of the theory and the history of gymnastic instruction, was very large and important. Through him the life and works of Jahn (*q.v.*) were first made really accessible. He wrote an extensive biography of Jahn (*Friedrich Ludwig Jahn, sein Leben und Wirken*, Stuttgart, 1881), and published an excellent edition of his works, with an introduction and explanatory notes (Hof, 1883). Euler's *Geschichte des Turnunterrichts* (*History of Gymnastic Instruction*), Gotha, 1891, is very valuable. His last and most important work consisted in editing his large *Enzyklopädisches Handbuch des gesammten Turnwesens* (*Encyclopedia of Gymnastics*) 3 vols., (Vienna, 1894–1896), a considerable part of which was written by himself. F. M.

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ANGERSLEIN. Article on Euler in Euler's *Enzyklopädisches Handbuch;* also biography in *Deutsche Turnzeitung* for 1899, p. 381.

EULER, LEONHARD (1707–1783). — A noted Swiss mathematician, born at Basel and educated under a scholar of great scientific ability, Johann Bernoulli. Some of the Bernoulli family being called to Russia by the empress, they used their good offices to secure a place for Euler. In 1733 he became professor of mathematics at St. Petersburg, and began a work full of promise, and, as it turned out, equally full of important results. The climate seems to have been responsible for a difficulty of vision that soon developed, and in 1735 he lost the use of one of his eyes. Six years later he was called to Berlin by Frederick the Great, and remained there for twenty-five years. He then returned to St. Petersburg, where he passed the last years of his life in total blindness. Euler was a prolific writer, especially in the line of analysis. He was one of the first to make extensive use of the imaginary in algebraic work, and to him is due the valuable formula $e^{\phi i} = \cos \phi + i \sin \phi$. His most important works are the *Introductio in Analysin Infinitorum* (1748), *Institutiones Calculi Differentialis* (1755), *Institutiones Calculi Integralis* (1768–1770), and the *Anleitung zur Algebra* (1770, with later French and English translations). To Euler is due not a little that has in late years developed into theories of importance, as in the calculus of variations, the study of the beta and gamma functions, and the modern theory of primes. His work in astronomy, optics, and physics was also of far-reaching importance. D. E. S.

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EUREKA COLLEGE, EUREKA, ILL. — A coeducational institution which grew out of the Walnut Grove Seminary, established in 1848 and incorporated as a college in 1855.

Preparatory and collegiate departments are maintained. The entrance requirements are equivalent to about fourteen units of high school work.

EUSEBIUS (260–340). — Historian, apologist, exegete, critic, scholar, and theologian, was born about 260 A.D. at Cæsarea and educated in the Christian school of that city. Cæsarea was then the metropolis of Palestine, and its great school, founded by Origen (*q.v.*), rivaled that of Alexandria. Here Eusebius was a pupil of Dorotheus, a famous teacher of liberal mind and Greek culture. He formed one of the most beautiful friendships known to history with Pamphilus, the first wealthy Churchman who spent his riches in the accumulation of a library. In this unrivaled collection, Eusebius reveled with the delight of a bookworm, and over this school he presided for many years. The most learned man of the fourth century, he became Bishop of Cæsarea in 313, and was soon recognized as one of the foremost men in the Church. His reputation as the most learned of its members and as the chaplain and confidant of the Emperor Constantine made him a prominent figure in the Council of Nice, at which he delivered the opening address. His attitude toward the Arians during this council and afterwards was severely criticized, but he has been acquitted of error by the general consent of the learned men of later times. His mind was acquisitive rather than productive, broad rather than deep, and his spirit was tolerant. He sought out the elements of truth in all philosophic systems and popular religions, and found in them a foothold for Christian teaching. Standing between the old pagan and the new Christian civilization, he strove to conserve the most precious remains of the past for the use and instruction of the future. He had the instinct of genius for choosing themes of permanent interest. With vast erudition and sterling good sense he drew from the storehouse of the past those things which it was worth while to preserve from oblivion. While his theological and exegetical writings are of solid value, he is best known by his *Ecclesiastical History*, which justly entitles him to be known as "the father of church history." It covers the first three centuries of Christianity, and is absolutely indispensable to the student. Its value lies not in literary merit, but in the wealth of materials drawn from original sources, and the wisdom and honesty with which they were used.
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RICHARDSON, E. C. *Life of Constantine* (trans.); *ibid.*

EUSTOCHIUM, JULIA (368–419). — Saint of the Roman Catholic Church, daughter of a Roman senator, whose wife Paula with her daughter was under the spiritual charge of St. Jerome (*q.v.*). To these women Jerome addressed his letters on education (esp. Ch. XXII), which form most important sources of information concerning early Christian education, especially of the monastic type. Both Paula and Eustochium were instrumental in founding and directing monasteries for women, and hence were important leaders in the early education of women.

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EUTHENICS. — See EUGENICS.

EVAGRIUS. — Ecclesiastical historian; born at Epiphania in Syria, 536 A.D., and trained for the legal profession in the schools of the rhetoricians and grammarians. He practiced law with signal success at Antioch, and won for himself the surname "Scholasticus." His chief work was his *History*, covering the years 431 to 594, and intended as a continuation of the *Church Histories* of Eusebius and Theodoret. Though somewhat credulous, he had learned from Eusebius the importance of quoting the original documents, and has preserved many of great value to the student and historian. He took great pains in collecting materials, wove them into a spirited narrative, and exhibited many of the best qualities of a historian.
W. R.

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PARMENTIER, L., and BIDEZ, L. *Evagrius.* (London, 1898.)

EVANS, EVAN WILLIAM (1827–1874). — Educator and author, graduated at Yale College in 1851; principal of the Delaware Literary Institute, and instructor at Yale College; professor at Marietta College and Cornell University; and author of a series of mathematical textbooks.
W. S. M.

EVELYN, JOHN (1620–1706). — English gentleman and author, who took considerable interest in education. He received his instruction from the village schoolmaster in the porch over the church at Wotton. He was a student at Balliol College, Oxford, 1637, but himself states that he was idle there. He was also a student of law at the Middle Temple, but, again, learned little there. From his travels he learned much, including French, Italian, and Spanish. At Padua, where he studied, he was elected *Syndicus Artistarum*, but was disqualified by proceeding on his travels. In 1667 Evelyn secured the Arundelian library of the Howard family for the new Royal Society, of which he was one of the early members. In the same year he obtained for Oxford from

Henry Howard the Arundelian Marbles. In 1672 Evelyn was secretary to the Royal Society. He is well known as a writer on medals, architecture, sculpture, landscape gardening. In 1656 Evelyn translated the first book of Lucretius into English verse, and in 1667 issued *Instructions concerning the Erection of a Library*, from the French of G. Naudé. His Diary (first published in 1818 and 1819) is very valuable in its references to current social life.

On the educational side, Evelyn wrote a letter, dated Sayes Court, Sept. 3, 1659, to Robert Boyle, proposing a plan for a mathematical college. He gives practical details for the living together of a small society for the purposes of study, and states that if he had not others depending on him: "I would cheerfully devote my small fortune towards a design, by which I might hope to assemble some small number together, who would resign themselves to live profitably and sweetly together."

In 1659 Evelyn published *The Golden Book of St. John Chrysostom, concerning the Education of Children*, Translated out of the Greek by J. E. Esq. (*i.e.* John Evelyn).

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EVENING SCHOOLS. — Schools of various kinds, public and private, in which instruction is given chiefly to those who are prevented from attending day schools by the necessity of earning a livelihood. These schools, in general, offer educational opportunity along three lines: (1) A repetition of the work of the regular elementary and secondary day school; (2) vocational instruction, chiefly along commercial and industrial lines; (3) general informational and cultural instruction for those whose daily work offers little or no opportunities for such instruction. Nearly all countries have such schools at the present time, and they are materially helping in the education of the working people. One feature of special significance is the greater adaptation of these schools to the needs of the people than is found in the day schools, which are so largely bound down by traditional subjects and traditional methods. Since the needs of the people reached by these schools vary so widely, each country would naturally have a different type of evening school.

Germany. — The evening schools in Germany owe their origin to the establishment of Sunday schools for teaching religious truths to youth preparing for confirmation. These were first established by the Bishop of Samland in 1569. Under Frederick II secular subjects were introduced, and the schoolmaster became the teacher. In 1765, according to the General Regulations of the Catholic schools of Silesia, all persons under twenty years of age who had left school were required to attend Sunday instruction in Christianity, and after this, for two hours, to attend lessons in reading and writing. In some places a general education was given, while in others, where the need of it was more marked, various kinds of industrial instruction were introduced. Gradually this instruction, instead of being given entirely on Sundays, was given on weekday evenings as well, and, while to-day there are still some schools which give instruction on Sundays, the majority of them are evening schools. These schools constitute the main part of the continuation school system of Germany, which, in turn, forms such an important element in the general system of industrial education of the country (*q.v.*).

England. — The first evening schools in England were, in all probability, private schools for the instruction of such as could not attend school during the day. Early in the eighteenth century the Society for the Promotion of Christian Knowledge (*q.v.*) issued a circular recommending masters and employers to appoint some hours in the evenings of certain days of the week to teach such grown persons to read as had neglected study. There is little information regarding evening schools during the eighteenth century, and while schools of this kind were established under private auspices and under the charge of benevolent societies, it was not until the nineteenth century that they began to become important. In 1806 an evening school for boys and girls who had to work during the day was opened at Bristol by the Benevolent Evening School Society. The instruction offered in this school was gratuitous, and only for sons and daughters of the laboring poor. The subjects taught were reading, writing, and arithmetic. Then for nearly forty years little was done in developing this kind of educational work; but in 1839 Bishop Hinds laid special emphasis on the importance of evening schools, and recommended that instruction in them be limited to those under sixteen years of age. After 1830 the Science and Art Department was largely instrumental in the establishment and extension of evening schools chiefly by means of grants of public money to those managers, teachers, and students who fulfilled the conditions laid down. In 1851 the Education Department first began to give grants to elementary evening schools, and in 1855 the first capitation grants were made to them. Payments were also made to teachers in these schools, but in 1861 teachers in day schools were forbidden to teach in night schools. The revised code of 1861 withdrew aid to teachers, but abolished the restriction on day school teachers. Capitation grants were made on average attendance, and payments were made for results of examinations in reading, writing, and arithmetic. During this time, and until 1893, schools received grants from both the Education Department and from the Department of Science and Art. The result of the restrictions of the education department was to make these schools rely more on the department of science and art.

The attendance at evening schools increased up to the year 1870. In that year the act relative to evening schools set no limit on the age of students, nor was the work compulsory. The instruction given was almost entirely limited to elementary work, in that grants were given only for such work. Work of a more advanced character was, nevertheless, demanded by the students and given. School boards were not specifically empowered to conduct evening schools, but the times when schools should be in session were not defined, and hence the boards were left free to do as they pleased. The next year the grants were definitely limited to persons not over eighteen years nor under twelve years of age. This resulted in a decrease in the attendance. In 1876 the upper limit was raised to twenty-one years. In 1882 no grants were given except for those between the ages of fourteen and twenty-one. In the act of 1890 it was definitely stated that the principal part of the instruction need not be elementary. This resulted in a rapid development from elementary to advanced work. Shop instruction and special industrial subjects were introduced and became popular. Thus the schools more and more grew to be secondary in character. The public had refused to provide for such training in the public day schools, and it was inevitable that evening schools, responsive as they always were to the needs of the people, should take on the character of secondary schools for the masses. A further impetus was given in 1893, when a new code for evening continuation schools was published, widely extending their scope. In 1900 the Cockerton judgment (*q.v.*) declared it illegal for school boards to apply the Parliamentary grant for other than elementary subjects or for pupils above fourteen. While this decision deprived the evening schools of the grant for elementary education, it had nothing to do with grants from the Science and Art Department. By the act of 1902 it was definitely declared that "all instruction after 4 P.M. is secondary," thus definitely declaring that hereafter the evening schools should not receive grants as elementary schools. Elementary instruction was still provided, and grants made for it, but higher grants were paid for more advanced work. By this act the previous regulations regarding the evening schools were combined with the science and art regulations in so far as these affected the evening schools.

As at present constituted, no pupils are admitted who are not exempt from attendance at the regular day schools. The law requires all between the ages of five and fourteen to attend the day schools, unless they have attained a certain standard. The minimum age for admission to the evening schools is twelve years, and very few pupils are under thirteen. The administration of these schools was formerly divided between the Science and Art Department and the Education Department. Now, as far as they are administered by educational authority, the Board of Education has complete charge. A great many of these schools, especially in London, were founded by the various guilds, and many are conducted in connection with the private technical schools throughout the country. These night classes often reach a far greater number of people than do the day classes. All these may receive grants from the Board, if their courses comply with the regulations. Each school is supported partly by local authority, either private or public, and partly by the public grants from the central government. At least twenty-five per cent of the expenditure of the school must be met by the local authority, by endowments, subscriptions, tuition fees, etc. In addition to this grants of money, prizes, and certificates are given to pupils who successfully pass examinations in the various subjects.

The question of charging fees has been in a very unsettled condition, schools sometimes charging fees and sometimes not. The tendency is distinctly in favor (1) of charging fees for all evening students; (2) of making fees for those under sixteen less than for those over that age; (3) of charging more for higher than for elementary subjects. It is found that a nominal fee is more likely to insure good attendance. The usual number of evenings per week is three, but in certain cases four or even five evenings are given. The ordinary hours are from 7.30 to 9.30, but in the commercial schools and some others they are from 7 to 9.30. This interval is divided into two, or in some cases into three periods. The session usually begins in the middle or latter part of September, and lasts until the end of April. A small number of classes continue until the middle of July, but very little work of a solid character is done after the end of April. Many schools do not begin until the first of November.

According to the code of 1905 the subjects in the evening schools are grouped in six divisions, as follows: I. (*a*) Preparatory and general: Reading, composition, writing, arithmetic, knowledge of common things, elementary principles of science, elementary drawing, life and duties of citizens, theory of music, and vocal music. (*b*) Literary and commercial: English, Latin, French, German, any other modern language, geography, history, economics, mercantile law and practice, commercial correspondence and office routine, bookkeeping, shorthand. II. Art. III. Manual Instruction: includes woodwork and metal work. IV. Science: Any generalized or special branch of science, including mathematics, will be accepted if adequate. V. Home occupations and industries: Needlework, domestic economy, cooking, dressmaking and cutting out, laundry work, dairy work, gardening, cottage industries, ambulance, home nursing. VI. Physical training: This aims at the general physical development of those instructed. Adapted to the age and sex of the pupil.

These are the subjects authorized by the Board for which grants are given. Few schools have all of these, nor is it intended that they should. On the other hand, other subjects than those mentioned may, at the discretion of the Board, be recognized. All schools must have at least two subjects, although no pupil is compelled to take more than one subject. (The industrial work of the schools is described in the article on industrial education.)

France. — The evening schools in France form a large part of the system of continuation schools. Taken together, they are called *éducation postscolaire*, or *œuvres complémentaires*, and are included in the department of primary instruction. They were probably introduced from England in 1820, when an evening school was established in Paris. They were in a flourishing condition at about the middle of the nineteenth century; in 1867 there were 35,000 such classes, but after this there was a decline. In 1895–1896, 15,000 courses were offered, with an attendance of about 270,500, while in 1906–1907 there were 48,248 courses, with an attendance of about 600,000. These classes are held in the evenings, and generally in the public school buildings. Great freedom is allowed in the establishment and conduct of these classes. Any one who desires may open a class, provided he has the approval of the mayor of the commune, the prefect of the department, and the academy inspector. A decree passed Jan. 13, 1887, places the minimum age for admission at thirteen years. A strong feeling exists that attendance should be made compulsory up to seventeen years of age, and for a fixed annual term, but efforts to this end have so far failed. At present, any one attends who wishes and as long as he likes. Certificates of attendance are given, which carry some weight with certain employers, and prizes are often given by local authorities or by individuals. Aside from these there is nothing to induce or to compel attendance other than interest in the work itself or the social attractions of the classes. The classes for men and for women are usually separate, but mixed classes are frequently held in the larger places. It is difficult to secure enough money for this work. Small fees are often charged, but the people who most need the instruction are those who can least afford to pay for it. The state makes an annual appropriation for this work, which amounted in 1906 to 600,000 francs ($120,000). The chief sources of support are private subscriptions and subsidies granted by local authorities. The teachers are, as a rule, public school teachers, and usually serve without extra compensation. They do, however, receive official letters of recognition, diplomas, medals, decorations, etc., which are greatly prized by the recipients. The classes are divided into: (1) *cours d'adultes*, classes for illiterates, (2) *cours complémentaires*, continuation classes proper, and (3) *cours techniques*, technical classes. Many private societies also are engaged in maintaining evening continuation classes.

United States. — There are many agencies in the United States conducting evening schools of various kinds. Many private and endowed institutions are conducting very valuable schools in different parts of the country. Among these are the various Mechanics' Institutes (*q.v.*) and allied organizations, and such institutions as Pratt Institute and Cooper Union (*q.v.*) in New York City. The classes given under the auspices of the Y.M.C.A. and the Y.W.C.A. are of great value and reach large numbers of boys and girls, men and women. The instruction offered by these organizations differs widely, varying from classes in reading and writing to courses in plumbing, scientific advertising, automobiling, and almost every branch of industrial, technical, and commercial as well as cultural instruction. The great development in this country, however, has been in the public evening schools. No other educational agency is reaching so large a part of the working people as these evening schools. The history of these public evening schools may be roughly divided into three periods.

I. *Private Evening Schools.* — The first private evening school mentioned in the records for New York City is that taught or proposed to be taught by James Lyde in the customhouse in September, 1730. It was a " mathematical " school, and included such subjects as " arithmetic in all its parts, geometry, trigonometry, navigation, surveying, gauging, algebra, and sundry other parts of mathematical learning." But while this is the first private school, it must be noted that evening schools in connection with the public elementary schools were common, if not the rule, among the Dutch of New Netherlands and Colonial New York. They are thus found at New Amsterdam in 1661, Kingston in 1668, Flatbush in 1670, and thereafter. It seems probable from apprenticeship records that these evening schools were especially attended by those who were engaged in work during the day. The rates of tuition for evening instruction were higher than in the day school. (See NEW YORK STATE.) Private evening schools seem to have had their greatest development in the beginning of the nineteenth century. In 1823 the Public School Society passed a resolution permitting their teachers to hold evening schools in the school buildings at their own expense. Tuition fees were usually charged. In New England the first mention found of a private evening school is a notice in the *Boston News Letter* of one kept by Mr. Samuel Granger in Boston in 1724. He taught "writing, accounts, and the mathematics." From 1750, at least, there are evidences that private schools where instruction was given in the evening were not at all uncommon. These schools were especially common from 1780 to 1815 or 1820. In Dorchester a school for apprentices in the paper mills and "other studiously inclined boys" was kept by Samuel Crane from 1790 to 1797. He also kept a day school. In Pennsylvania there is a record of an evening school in Germantown in 1702, which was kept by the learned Pastorius "for such as could not attend the day school." A night school is mentioned as having been conducted in Philadelphia in 1751, in which, besides the ordinary subjects, "geometry, navigation, and mensuration" were taught. From these references it seems probable that private evening schools were quite common in New England, New York, and Pennsylvania, at least during the latter part of the eighteenth century and up to 1820. Some of these were for apprentices, and all were for working people.

II. *Evening Schools founded by Benevolent Societies.* — Probably the first free evening schools in the country were established for slaves and other negroes by the Society for the Propagation of the Gospel (*q.v.*). One of these was started in Staten Island in 1715. From that time on others were conducted both in Staten Island and New York. In 1787 the Manumission Society also maintained schools for negroes in New York. In Philadelphia work among the negroes was prosecuted largely by the Society of Friends. In 1789 the Society for the Free Instruction of the Black People conducted an evening school for adult negroes. This school continued with some interruption up to 1835 or later. Other societies of Friends established schools of the same kind. In some cases the same societies conducted evening schools for adult whites and adult negroes. In Salem, in 1774, there was a school conducted under the charge of the selectmen and paid for out of the interest on money previously given for the support of schools and for the tuition of poor children. In this school, twelve boys were to be instructed free of charge on three evenings of the week. This was largely an affair of charity. The beginning of the real philanthropic movement in Boston and Salem seems to have been about 1810 or a little later. In 1814 and 1815 two charitable schools for girls were founded by an association of young women in Salem. In 1816 Sunday schools were first introduced into Boston, and for a time these gave instructions to poor boys and girls in reading and writing. These, while not evening schools, served to call the attention of the public to the need of instruction for boys and girls at work. Very soon serious objection was made to such secular instruction on the Sabbath, and other time had to be found for it. It is probable that this helped to pave the way for evening schools later. In 1823 the selectmen aided the cause of evening schools by appropriating $75 for such a school for young men over fifteen years old. There is nothing to indicate that this was considered in any way a part of the school system. From now to the time when evening schools were formally established, such work was mainly conducted by philanthropic and religious societies. In 1836 Warner Street Chapel in Boston opened a free evening school, which continued for twenty years at least, and was very successful. Several other schools were conducted by religious agencies during the same period. In 1856 the number in attendance on these schools was not far from 2500. Frequently the agencies in charge of these schools received aid from the city, sometimes in the form of free use of buildings, of heat and light, and often by direct appropriation of money. The schools were free, no tuition being charged. They were not, however, considered a part of the public school system, and were controlled by other agencies. The first indication of this movement in Pennsylvania might be said to be in the industrial evening school conducted by the Moravians at Lititz in 1754. Here boys who were employed during the day were taught "some useful knowledge" three evenings a week. In 1799 the young men who afterwards founded the Philadelphia Society for the Establishment and Support of Charity Schools conducted evening classes for apprentices, clerks, and others. Some young ladies also conducted evening schools among the poor at the same time. The schools for adult negroes and whites have been mentioned, and it is probable that other societies had schools for whites as well as negroes. About 1847 the Missionary Society of the Church of the Atonement, in Philadelphia, conducted the Logan Evening School. This had in 1850 an enrollment of 216. In 1850 the city appropriated $2000 for the establishment and support of free evening schools, and from that time they have been conducted by the city. The beginning of the philanthropic movement in New York dates from about 1830. The records of the Public School Society show numerous requests for the use of the public school buildings for free evening schools. These requests came from private citizens and associations. In nearly every case they were granted. The need for such schools was so great that soon after, in 1833, the Public School Society undertook the work, and opened four schools for apprentices and others. They were quite successful, and were conducted for several years thereafter. But owing to the fact that the day school teachers were required to teach the evening classes also, and without additional pay, there were lack of interest and considerable objection on the part of the teachers. There was some doubt about the right to expend public money for such schools, and in consequence they were discontinued. These schools were free and quasi-public; the money used for their support was taken from the general fund of the society, which was made up in part of public money and in part of gifts and bequests. After this there seem to be no records of evening schools until 1847. They may have been continued, supported by philanthropic agencies.

III. *Free Public Evening Schools.* — The free public evening school developed directly and naturally from the evening school controlled by philanthropic agencies and partly supported by public funds. The schools opened in 1833 in New York were free, and, in a sense, public, for they were supported in part from public funds. In 1847, at the urgent solicitation of the board of education, the legislature of New York passed a law empowering the board to conduct evening schools for males and authorizing the expenditure of $6000 per annum for this purpose. Acting on this authority, the board opened six schools in November, 1847. These were in charge of a special committee on evening schools. They were kept open for a term of seventeen weeks, and had an enrollment of 3224. Admission was refused to hundreds. Thirty-one teachers were employed. In 1848 the legislature authorized the opening of evening schools for women and girls, and allowed an expenditure of $15,000. This greatly increased the usefulness of the schools, and their development was rapid. Evening schools were also authorized in Brooklyn by the law of 1850, and were organized in Baltimore in 1840 by the board of education, when six schools were opened for apprentices and other young men. They were, however, discontinued in 1843. The reasons given by the board were (1) want of patronage, (2) expense, (3) application of the means for education of apprentices that should be used for the instruction of younger pupils. In 1856 they were again resumed. Louisville, Ky., was one of the first to experiment with public evening schools. In November, 1834, a small public evening school was opened, which was continued for two years and then discontinued, opened for one year in 1842, for another year in 1859, for three or four years in 1873, and finally established in 1882. Ohio was the first state to pass a law regarding the establishment of public evening schools (Section XVI of the act passed by the legislature of Ohio, Mar. 16, 1839). In accordance with this act there were opened in Cincinnati in November, 1840, three evening schools, which had a fairly continuous existence, being in session all but one year up to 1861. In 1855 schools for girls were also opened. So far as can be determined, no other city in Ohio opened evening schools in accordance with this law. When the common schools were reorganized in 1853, it was no longer made obligatory to provide such schools, but it was left to the discretion of the school boards. By an act of the legislature of Massachusetts approved Mar. 29, 1847, permission was given to cities and towns to appropriate money for the support of schools for the instruction of adults in reading, writing, English grammar, arithmetic, and geography. In this act no mention is made of the time of day when such instruction would be given, and there is nothing to indicate whether it was intended to apply this to evening schools or not. Cities interpreted it variously. New Bedford opened two evening schools in December, 1848, which were supported from the regular funds, and Worcester opened three schools in 1849, also supported by public money. But when Lowell tried to do the same, the opposition was so strong that an injunction was obtained which stayed the payment of the money appropriated. The matter was definitely settled in 1857, when an act of the legislature formally authorized the payment of money for the maintenance of evening schools. It was some years before the attempts to establish them in Boston and Salem were successful. In Boston six schools were opened under the charge of a special committee in 1868, and the next year they were formally incorporated into the school system. In Salem the evening schools were finally taken over by the city in 1869. In 1883 Massachusetts passed a law compelling towns having 10,000 inhabitants or over to maintain elementary evening schools. Connecticut has a similar law. Since 1886 in Massachusetts, cities having 50,000 inhabitants or over have been under obligation to support an evening high school upon the petition of fifty or more residents over fourteen years old who desire to attend. In Indiana all cities of 3000 inhabitants or over must conduct evening schools on petition of twenty or more citizens. In New Hampshire all towns of 5000 inhabitants or over are compelled to establish evening schools on petition of five per cent of the voters. In Pennsylvania cities must conduct such schools on petition of twenty or more parents of children six years old or older. In Ohio, Louisiana, and Georgia permission is directly given to conduct such schools, and in several other states it is implied. Some of the other cities which opened public evening schools at an early date are, Providence, in 1849; Springfield, Mass., about 1850; Fall River, 1858; Lawrence and Lowell, 1857; Pittsburg, in 1856 and probably earlier; San Francisco, in 1856; St. Louis, in 1859; and Chicago, in 1862. In 1860 there were at least fifteen cities where evening schools had been conducted as part of the public school system. Nearly all the larger cities were familiar with the idea of such schools and of the use of public money for their support.

Evening High Schools. — While the first movement for evening schools was toward giving those who lacked the rudiments of education the opportunity of acquiring them, there was very early manifested in some cities a tendency in the direction of affording means of further education to those who were studiously inclined and ambitious to improve themselves. The earliest indication of this was in Cincinnati, Ohio. As early as 1828 the Ohio Mechanics' Institute conducted lectures and classes in botany, chemistry, mechanics, geometry, and arithmetic. Apprentices and minors, sons of members, were entitled to attend these classes on payment of fifty cents per annum. This was a school of science, not a high school, was not free, and was restricted to a certain class of people, but it exerted a strong influence on the establishment of an evening high school. In 1841, and possibly earlier, the trustees of Woodward College and high school, then a private endowed institution, conducted evening classes in the college rooms, in which were taught " mercantile arithmetic, bookkeeping, algebra, geometry, architectural drawing, plane trigonometry with its applications, surveying, mensuration of planes and solids — particularly of carpenters', painters', masons', and bricklayers' work, etc." These classes were organized for young men who were at work during the day. This college or academy was, in 1851, merged into the public school system as the Woodward High School. The first evening high school in the country, conducted by the public school authorities, was opened October, 1856, in Cincinnati, and was undoubtedly the direct outgrowth of the two schools previously mentioned. In this school a preliminary examination in elementary subjects was required and a three-year course laid out. The first year there were 108 in attendance, all in the lowest class, besides some others in a preparatory class. The studies pursued in the lowest class were algebra, geometry, bookkeeping, drawing and design, and vocal music. The first public high school of any kind to be established in New York City was the evening high school, which was opened in 1866. This school was successful from its opening, and has had a continuous existence. In 1877 the number examined for admission was about 3500, and the number passed about 1800. No other evening high school was opened in New York City until 1887. An evening high school was first opened in Chicago in 1868. The same year the O'Fallon Polytechnic Institute was established in St. Louis. This was an evening high school, but with emphasis upon practical training. The same might be said of the Artisans' Night School, opened in Philadelphia in 1869. It included in its curriculum mechanical and engineering drawing and steam engineering, as well as geometry, physics, and chemistry. It was gradually changed by the elective system into an ordinary high school, and in 1898 its name was changed to the Evening High School. Boston established an evening high school in 1870. There were, then, in 1870, at least five public evening high schools. These schools were not all of the same grade, the variation being much greater than in the day high schools. Some gave very elementary work, while some few were and are real high schools recognized as on a par with the day high schools, organized in courses leading to a diploma. In the majority of these schools there is a distinct tendency toward the more practical subjects, although the studies included in the curriculum of the day high schools are not neglected.

The usual time given to evening school work in this country is two hours per evening for four evenings a week, and twenty weeks a year, but this time varies greatly in different cities. One of the greatest difficulties is irregular attendance, the per cent of attendance on total enrollment ranging from twenty to sixty, or a little over. Various methods have been tried to counteract this. One that has been tried and has been very successful is that of charging a nominal tuition fee, $1 or more a term. This is refunded at the end of the term in case a certain per cent of attendance is reached. The majority of teachers in the evening schools are day school teachers, but there is an increasing demand for specially trained teachers for this work, for it is coming to be realized that it takes a different type of teacher to do the best work in the evening school.

Classes of Pupils Reached. — (1) Those who are deficient in the rudiments, or who have not had an education equivalent to that of our elementary schools. Probably fully eighty-five per cent of the total number of the pupils are of this class. This class is composed of native Americans and of foreigners. Among the foreigners two classes are distinctly marked off: the illiterates, who not only do not know English, but have had practically no education at all, and those who are more or less educated. Many of the latter have received a liberal education in their own country, but on account of inability to speak and write English are at a great disadvantage. In the large cities, which receive such large numbers of immigrants, the per cent of foreigners in the evening schools is very large, while in other cities it is much smaller than the per cent of native Americans. (2) The second class found in the evening schools is made up of those young people who have passed through the elementary grades and some even partly through the high school, and who wish to complete their education. The needs of this class are as varied as their occupations. Some wish to prepare for entrance to college or university. The greater part, however, wish to prepare themselves for higher positions, for greater efficiency in the occupations in which they are engaged. From these has come an increasing demand for technical and trade work, and it is very largely this class which is found in our few evening trade and technical high schools. (3) Another class, more or less distinct from the last, consists of men in business who wish help along special lines. There are very few opportunities for such training in our public evening schools. The Evening School of Trades, in Springfield, Mass., meets this need, in a way, and sometimes the classes of the Y.M.C.A. in a few cities.

Attendance and Enrollment. —Thirty-two cities reported evening schools in 1881, 165 in 1900, and 233 in 1909. The total enrollment in the cities reporting was 150,770 in 1890, 203,000 in 1901, and 379,052 in 1909. In the five years from 1904 to 1909 the total enrollment increased forty per cent. These figures include only those reporting to the United States Bureau of Education. It is probable that the enrollment is larger than this, for all do not report. In 1904 there were thirty-two cities reporting evening high schools, and the enrollment was 40,568. In 1909, seventy-six cities reported evening high schools, and the total enrollment was 75,342. In spite of the great increase in the enrollment in the evening schools, and their gratifying development, they yet reach but a small part of the young people under twenty-one who are not in schools of any kind. In 1907 a careful estimate was made of the young people between the ages of fourteen and twenty who were enrolled in schools of any kind. The data obtainable were by no means accurate, and the figures are subject to many inaccuracies, but it is the best estimate that there is, and probably indicates quite accurately the general educational situation in the cities of 25,000 inhabitants and over to-day. This estimate is found in Bulletin No. 1, 1907, of the Bureau of Education, p. 29. The number of pupils at each age is expressed as the per cent of the total number of young people fourteen years old.

Percentage of School Enrollment, based on the Total Number of Children 14 Years Old.

	14	**15**	**16**	**17**	**18**	**19**	**20**
Private, public, and parochial schools, elementary and secondary . . .	79.4	51.48	34.15	20.0	10.4	5.15	2.2
Normal schools, colleges, universities, and professional schools				0.5	1.5	2.0	3.0
Public evening schools Y.M.C.A. and Y. W. C. A. classes	4.37	6.17	5.49	3.34	2.84	2.84	1.73
Total percentages	83.77	57.65	39.64	23.84	14.74	9.99	6.93

According to these statistics, it appears that, taking the total number of young people between the ages of fourteen and twenty, 66.21 per cent are not in schools of any kind. At the different ages this appears as follows: At fourteen years old, 16.23 per cent are not in school; at fifteen years, 42.35 per cent; at sixteen, 60.36 per cent; at seventeen, 76.16 per cent; at eighteen, 85.26 per cent; at nineteen, 90.01 per cent; at twenty, 93.07 per cent. It can thus be readily seen that the evening schools are not beginning to meet the needs of the young people who can profit by such work.

Evening Schools in Cities of 8000 Population and over, 1910.

	Total	Elementary Classes	Secondary Classes	Vocational Classes
Number cities reporting . . .	227	175[1]	72[1]	67[1]
Teachers . . .	9,324	[2]	[2]	[2]
Enrollment . .	374,364[3]	224,528	81,229	37,994
Average daily attendance . . .	145,193	[2]	[2]	[2]

A. J. J.

See also under the articles on the separate national systems of education; also Apprenticeship and Education; Continuation Education; Industrial Education; University Extension; Young Men's Christian Association.

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EVERETT, CHARLES CARROLL

EVERETT, CHARLES CARROLL (1829–1900). — Educator and author; educated at Bowdoin College (graduated 1850), the University of Berlin, and the Harvard Divinity School. He was four years instructor at Bowdoin College, and twenty-eight years professor at Harvard. Author of schoolbooks on ethics and civics and numerous philosophical works.

W. S. M.

EVERETT, EDWARD

EVERETT, EDWARD (1794–1865). — Statesman and educator; born at Dorchester, Mass., April 11, 1794, and educated in the public schools of Boston, the Phillips Academy at Exeter, and at Harvard College, where he graduated in 1811. In addition to his public career as member of Congress (five terms), Governor of Massachusetts (three terms), Minister Plenipotentiary of the United States to England, and Secretary of State under President Fillmore, Mr. Everett was two years tutor in Harvard College (1812–1814), six years professor of Greek (1819–1825), and three years (1845–1848) president of the college. His educational writings include *Education of Mankind* (1833), *Superior and Popular Education* (1835), *Importance of Education in a Republic* (1838), *University Education* (1846), *Education and Civilization* (1852), and *Academical Education* (1857). He died at Boston Jan. 6, 1865. W. S. M.

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[1] Fifty-one cities did not report enrollment in elementary, secondary, and vocational classes separately.

[2] Not reported by classes.

[3] Includes pupils not reported by classes.

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EVIDENCE. — What from the deductive point of view is called proof, or demonstration, is, from the inductive side, evidence and its interpretation. Proof consists in showing that a certain proposition or belief follows from principles which are independently accepted. Hence the question ultimately comes back to question upon what the principles themselves rest. Either they are assumed as self-evident or axiomatic, or they rest upon certain supporting facts as their evidence or ground of acceptance. Each branch of belief and science has of course its own distinctive type of evidence — that is, of concrete facts that are adduced in support of its conclusions. From a logical point of view, the essential thing about a power of good judgment is that (1) it is aware of the sort of evidence required in a given field ; (2) is skilled in selecting among facts or in sifting material so as to decide which is good evidence and what not ; (3) and apt in using the material selected, in interpreting it as bearing upon any suggested principle. In practical and social matters, persons are confronted with complex situations, not with abstract principles, so that the essential thing in dealing with them is to be able to select, weigh, and use evidential material. Hence one of the most serious objections to an exclusively deductive method of teaching is that it affords no education fitting individuals to cope with the concrete situations of life. The same holds good, of course, in even greater measure, with methods of instruction that depend mainly upon dictation, learning by rote, or implicit reliance upon dogmatic rules. J. D.

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EVOLUTION. — THE PHILOSOPHICAL CONCEPTS. — As a philosophic and cosmological concept, the notion of evolution was first formulated by the "nature philosophers" of Greece receiving its most striking statement at the hands of Heracleitus, who regarded all nature as a scene of "becoming" according to a certain law of proportionate exchange, termed by him *logos*. Apparently no serious attempt was made to apply the conception to human history and society beyond a few elementary moral aphorisms. The Socratic movement checked in many cases further fruitful development of the concept of evolution. Accepting the doctrine of some of the "nature philosophers" that nature itself is of change, Plato and Aristotle both insisted upon the necessity of the control of this flux by fixed laws in the interest of fixed *ends* as the absolute termini or limits of change. Plato conceived the interrelation of the fixed types and ends, called by him Ideas, to natural change loosely and vaguely enough to permit him to conceive of a radical social change through the control exercised by absolute and objective purposes. But this very looseness left him open to the charge (by Aristotle) of separating change or becoming and true being, and thereby destroying the very idea of development. Hence Aristotle interpreted the Platonic philosophy so as to treat every case of genuine existence, or individuality, as a cycle of development from potentiality to its full term of completion, or perfection, in actuality. In this way, Aristotle appeared to give change a positive worth denied to it by Plato ; and even to make "development" his own fundamental category. It has thus been claimed by some modern philosophers that Aristotle not only expounded a philosophy of evolution, but the only satisfactory philosophy, since he found the meaning of developing change not in the cruder and earlier states (origins), but in the mature and later results (ends). This overlooks the fact, however, that Aristotle absolutely denied any evolution of forms, species, and ends, etc. ; and that his so-called development has to do simply with *individual* cases of change which are purely cyclical (circular) in quality, starting at one end literally to reproduce existent individuals in which the type of perfected form is already embodied, and, at the other end, terminating in an achievement of the fixed form of species. In this way, Aristotle confined change within certain absolutely fixed limits ; in providing fixed place and function for change he really gave the most effective aid to the formulation of the scholastic static philosophy of the universe and life.

The social and the scientific interests of the Renaissance centered in change. When motion was made the prime category of physical science, and reform and progress the chief aim of social endeavor, it was only a matter of time that evolution should become the dominant conception of philosophy. In the later eighteenth and early nineteenth centuries the conception was applied in social and intellectual matters by Herder, Goethe, and Hegel, and by Condorcet and some of the French Encyclopedists. About the same time in the middle of the nineteenth century that Darwin and Wallace were applying the idea to animal and plant life, Herbert Spencer attempted a universal synthesis on the basis of a generalized definition of evolution. In his own philosophy, however, he did not get beyond the notion of fixed cyclical recurrence of a chain of changes working between a fixed origin and fixed goal — evidence that his own thinking was never completely taken possession of by evolutionary conceptions. The influence of the concept of evolution upon the philosophy of education has been great, but indirect. As the general intellectual outlook of humanity becomes more dynamic, and the interest in novelty, variation of progress, correspondingly greater; and as faith grows in the genetic method as a method of intellectual analysis and definition, educational philosophy inevitably is influenced by the change.

Some of the concrete applications of evolutionary philosophy to educational concepts will be found under the captions ADAPTATION; ADJUSTMENT; CONFLICT; CONTROL; ENVIRONMENT; FUNCTION; HEREDITY; STIMULUS AND RESPONSE. J. D.

EVOLUTION IN PSYCHOLOGY. — In his discussions of the relation of biology to the science that deals with human life, Spencer raised the question whether there was any process of extra-organic evolution. The formulas which Spencer applied to human life are for the most part mere extensions of the formula of biological evolution. The general disposition in current psychological and sociological discussions is to accept Spencer's position and treat human life as a continuation of the process of biological evolution. Such terms as selection (*q.v.*), adaptation (*q.v.*), and variation (*q.v.*) are continually employed in sociological and even ethical discussions. In education the terms borrowed from biological science have frequently been employed to define the purpose and method of educational activity.

That there must be a clear recognition of some distinction, however, between human and animal life has frequently been suggested in scientific literature. Indeed, Darwin felt so keenly the importance of modifying the general formula of natural selection when applying it to human life that he wrote a volume on the *Descent of Man*. This volume substituted for the formula of natural selection, which Darwin developed in his *Origin of Species*, a formula of sexual selection or social selection. Later discussions of the same topic support even more fully the conclusion that we must work out a different view of the evolutionary process than that presented in animal biology in order to understand human life and human civilization. A frank recognition of the importance of consciousness suggests itself as the best solution of the difficulties thus recognized. With consciousness as a positive factor in human life there comes a type of selection and a type of control of the environment which has no parallel in animal evolution. Through mental activity the human being has gained a complete mastery of his environment. He works upon it and modifies it, rather than fits himself to its demands. It is certainly true that human bodily organization has undergone no radical transformation and no adaptation to the physical world within historical times, or even within the period covered by our anthropological data. Man seems thus to have departed from the general type of evolution which appears in the animal kingdom, and to have a type of adaptation which does not require change in his bodily organs. Such a view of evolution as this creates a demand for a distinct psychological treatment of the problem of human evolution. C. H. J.

See ENVIRONMENT AND ORGANISM; GENETIC METHOD; SOCIAL PSYCHOLOGY.

Scientific Theory of Evolution. — The concept of evolution has been found useful, and, indeed, necessary in almost every phase of scientific inquiry. We have, therefore, almost as many sorts of evolution as there are departments of science. Evolution may be cosmic, chemical, geological, organic, psychical, or social; and special phases of each of these fields of thought have their own laws, which are, often enough, laws of evolution. Thus there are intellectual evolution, moral evolution, economic, political, linguistic, artistic evolution, and so on. Herbert Spencer has formulated the law of evolution as follows: "Evolution is an integration of matter and concomitant dissipation of motion, during which the matter passes from an indefinite, incoherent homogeneity to a definite, coherent heterogeneity; and during which the retained motion undergoes a parallel transformation." The operation of this principle Spencer endeavors to find in the sidereal and solar systems, in geologic history, in the history of organisms, of social organization, of language, of science, of the industrial and æsthetic arts, etc.

The concept of cosmic evolution was used by the Greek philosophers, many of whom conceived of æons of time, during each of which a cosmos such as we know evolved from some primitive element and again was resolved into that element. Anaximander (611–547 B.C.) held this primitive element to be undifferentiated matter, chaos; Heracleitus (495–435 B.C.) thought of it as fire. In modern times the nebular hypothesis of Laplace and Kant has afforded the principal notion of cosmic evolution. According to it the solar system has emerged from a fiery mass of tenuous particles, and various sidereal systems and nebulæ illustrate different phases in this process, which is thus conceived as universal.

The concept of chemical evolution also is found among Greek philosophers. In general, they may be divided into two groups. One of these held that the various substances could all be transmuted into each other. Earth could become successively water, air, fire, and perhaps ether. Democritus (*fl. c.* 450 B.C.) arrived at the notion that the differences between substances could be reduced to differences in the form and size of their constituent atoms. Hence a change in form or size must involve a transformation of the substance. Others, like Anaximander, Empedocles (495–435 B.C.), and Anaxagoras (500–428 B.C.) held that the primitive elements could not be transformed into each other. Hence to them the process of chemical evolution was one of compounding and separating the original substances. Modern chemistry has followed this conception until recent years. The chemists have reduced the substances to elements, at present about seventy in number, and the innumerable compounds of these. The discoveries of certain periodic relations among elements and of radioactivity have, however, led many modern chemists to the belief that elements suffer transformation and may pass into each other. Thus chemical evolution becomes not merely a process of compounding and resolving elements, but of the actual change, decay, and transmutation of elements themselves.

The idea of geological evolution was familiar to the ancients. The theories of a primitive fiery state and of an earlier condition in which the world was covered with water, from which land surfaces later appeared, were common among them. Xenophanes (576–480 B.C.) identified fossils as the relics of former life, and argued from the presence of the fossils of marine animals upon mountains that they had formerly been covered by water. Avicenna, an Arabian philosopher of the tenth century, regarded mountains as either the effect of violent upheavals of the earth's crust, as by earthquakes, etc., or of erosion by water, or, perhaps, both forces. The earlier geologists were divided into the cataclysmic school, who believed that the various features of the earth's surface arose from violent cataclysms, and the uniformitarians, who held that they were produced by the action of causes found in operation to-day. Lyell may be regarded as the one who brought about the definite adoption of the uniformitarian point of view. The development of the concept of geological time was of immense value in furthering the employment of the general notion of evolution.

It is in reference to the history of organisms that the concept of evolution finds special application. For evolution is thought to mean progress, and while the transformations of the inorganic world are not in themselves betterments, the changes in the history of life have brought about what is recognized to be extraordinary advance. Indeed, the word "evolution" was first used by Bonnet (1720–1793) to indicate the development to a perfect form of that which is contained in a living germ. Among the Greeks the idea that the forms of life change and improve was well known. Thales and Anaximander held that life arose from the slime of the sea. The latter believed distinctly in abiogenesis, or the theory that life arose from the inorganic world, a view discredited to-day. Empedocles held that the forms of life thus arising from the earth were in great variety, and that those imperfectly adapted were exterminated, leaving the perfect forms. Thus we have a "survival of the fittest." There is no evidence, however, to convince us that Empedocles believed one species to be transformed into another by this process. The fixity of species was also maintained by Aristotle, who opposed to the conception of a chance origin of the forms of life and the survival of the better adapted ones the notion of the struggle of each individual to express perfectly the form of the species which was implanted in it. Such a struggle, he thought, explains development or evolution, which he, therefore, interpreted as orthogenetic rather than as dependent upon chance variation.

Modern study of organisms was at first under the dominance of the idea that species were fixed. Such seems to be the notion of Linnæus (1707–1778), although at times he suggests the possibility of transformation in particular cases. On the other hand, Buffon (1709–1788) inclines toward the notion of the gradual transformation of species through the influence of environment upon them. Among philosophers in the eighteenth century the idea of organic evolution became quite common, although the conservative forces of society were all on the side of special creation and fixity of species, a view supported not only by religious tradition but also by the great authority of Cuvier. Erasmus Darwin (1731–1802) and especially Lamarck (1744–1829) believed in organic evolution through the effects of use and disuse. In the early part of the nineteenth century the idea of the evolution of species through the natural selection of such chance variations as made for better adaptation was suggested by several naturalists, but it remained for Charles Darwin (1809–1882) to accumulate such a mass of evidence as ultimately to convince the scientific world of the existence of such a process. Darwin admitted the influence of the effects of use and disuse as a factor in evolution. Since his time several schools have arisen. The Neo-Darwinians, of whom the leaders are Weismann, Wallace, and Galton, deny the inheritance of the effects of use, and hence, on their view, the Lamarckian factor does not affect the evolution of species. The Neo-Lamarckians maintain the inheritance of acquired characteristics as a prime cause of evolution. (See ACQUIRED CHARACTERISTICS.) In recent years the possibility of evolution through the natural selection of chance variations has been questioned. The idea that it is through radical variations (mutations), such as produce at once new types (heterogenesis), has been advanced by some, notably De Vries. Others have revived in various ways the notion of orthogenesis held by Aristotle, although as a rule they have disclaimed the thought of a directing form embodied in the evolving species (preformation), and have maintained the opposed view of epigenesis. (See HEREDITY.)

When we come to social evolution, we find that only in modern times has the concept been extensively applied. Aristotle outlined certain evolutionary phases of the history of political forms. The enlightenment of the eighteenth century, although it began with a revolutionary repudiation of the past, came ultimately to regard all history as progress toward a higher mental, moral, and social condition. Here the German thinkers, Lessing, Herder, and Hegel, are especially important. Lessing finds the development of culture to be the necessary order in God's education of the human race. He also introduces the idea of evolution in art forms, a concept developed much further by Winckelmann and Hegel. Herder writes a philosophy of history, showing therein a constant evolution of higher social and political forms, not only within separate nations, but from nation to nation. Hegel finds the same evolution in the relation of the concepts of the mind, and hence holds it to be inevitable in the history of thought, and in all the products of nature and civilization. Comte reacts against German rationalism, and divides human evolution into the three stages of the theological, the metaphysical, and the positive or scientific and empirical. Yet he sees a necessary evolution from one to the other, and also in the development of the sciences, and, indeed, in all human phenomena. His influence is great upon the English evolutionists, especially Spencer. Huxley has pointed out the conflict between evolution by natural selection and human moral ideals. David Starr Jordan and Sir E. Ray Lankester have shown how in society with its artificial conditions we may get not progress, but rather degeneration as the result of the selective effects of war, new forms of disease, etc. John Fiske and Joseph LeConte have striven to show that there is no essential conflict between evolution and religious faith. E. N. H.

For statement of Darwin's formulation of the theory of evolution, see DARWIN, CHARLES; for other aspects of the subject, see HEREDITY; SELECTION; also ADAPTATION; ENVIRONMENT.

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EWART, WILLIAM (1798–1869). — A prominent English politician, educated at Eton and Cambridge, who devoted much attention to movements for social advancement and education. He was active in the movement for ameliorating the severe punishment for minor crimes. In 1835 he moved for the appointment of a school committee "to enquire into the best means of extending a knowledge of the fine arts and of the principles of design among the people — especially the manufacturing population of the country." The report of the committee led to the establishment of a School of Design at Somerset House in 1837, and ultimately to the Department of Science and Art. In 1837 Ewart advocated the opening of museums and galleries to the working classes. In 1845 he moved "that a statement be made on the part of the government of the condition and prospect of such educational establishments as were supported wholly or partially by a vote of this House," and "that it is expedient that schools for training of masters be more extensively promoted." Perhaps the chief service of Ewart was the passing of the Bill for enabling Town Councils to establish Public Libraries and Museums (1850). He also took an interest in the establishment of examinations for entrance into the civil, army, and diplomatic services, and in opening up facilities for the higher education of dissenters.

EWING COLLEGE, EWING, ILL. — A coeducational institution founded as the Ewing High School in 1867. The collegiate department was added in 1874, and the institution was placed under the auspices of the Baptists in 1877. Academic, collegiate, normal, fine arts, domestic science, and summer school departments are maintained. Candidates are admitted on an examination or upon certificates from accredited schools. The faculty consists of sixteen members.

EWING, JOHN (1732–1802). — The first president of the University of Pennsylvania, graduated at Princeton in 1752. He served as tutor at Princeton, founded the academy at Newark, Del., and was the first president of the University of Pennsylvania (1779–1802). He was one of the founders of the American Philosophical Society (*q.v.*) and the author of a *Natural Philosophy.* W. S. M.

EXAMINATION OF PUPILS. — See GRADING AND PROMOTION.

EXAMINATION OF SCHOOLS. — See ACCREDITED SCHOOLS; SCHOOL ADMINISTRATION; SUPERINTENDENT OF SCHOOLS.

EXAMINATION OF TEACHERS. — See CERTIFICATION OF TEACHERS; EXAMINERS, BOARDS OF.

EXAMINATIONS. — A term used to denote the method of testing educational progress, measured either by amount of knowledge acquired or by general intellectual capacity or ability. Such a method has been applied in all grades of education in one form or another. The earliest type of examination which prevailed was oral, either in the form of question and answer (cf. the textbook of Ælfric (*q.v.*), which would lend itself to such a method) or of disputations (*q.v.*). Disputation, determination, defense of a thesis, or the delivery of a public lecture, provided other requirements such as payment of fees, residence, and attendance at lectures were satisfied, are forms which examinations took at the medieval universities (*q.v.*); (for details and differences at various universities, see also DEGREES). The written examination was unknown at the universities probably until 1702, when it was introduced by Bentley at Trinity College, Cambridge. Practical examinations had been employed for a long time in the medieval universities in such a subject as medicine. But the examination in its modern form is a development of the eighteenth century. The first honors examination, the earliest examination in the modern sense, was the Mathematical Tripos, founded in 1747. The qualification for a degree was in fact merely four years' residence. Those who worked did so at their pleasure; for those who would work there were, even in the worst times, adequate lectures. The first Tripos introduced a new order of things, but until 1797 the proctors added any names they liked to the list. In 1772 the Master of St. John's College, Cambridge, established examinations in his college (Graham Balfour, *Educational Systems*). The lead was taken up by Oxford in the famous " Oriel ", revival. Before the end of the century examinations were introduced into Christ Church by Cyril Jackson, and in 1795 Oriel College began to elect to its fellowship from outside solely on the results of its own examinations. Oxford now progressed more rapidly than Cambridge. In 1802 a genuine examination for the B.A. degree was begun and a small honors list with the names in the order of merit was published. Between 1802 and 1870 there was an examination for the M.A. degree, but this never became effective, and there is not to this day any examination for the master's degree at Oxford or Cambridge. " In 1829 the Master and Fellows of Balliol began to elect scholars after examination. . . . . The most brilliant success attended these reforms, and encouraged similar measures elsewhere " (Balfour). Meantime in 1824 Cambridge had founded the Classical Tripos, though until 1850 it was only open to those who had passed in the Mathematical Tripos. The Moral Science Tripos and the Natural Science Tripos followed in 1851. In 1850 Oxford reorganized her examinations " and introduced Moderations as a test of pure scholarship in the middle of the University course." From this time forward new schools and triposes were created in rapid succession at Oxford and Cambridge.

A second development of examinations was to test ability to enter the professions, for which up to the nineteenth century preparation through a period of apprenticeship had prevailed. While many of the old professional societies have remained unchanged, the method of admission has been changed to an examination basis. For details see articles on ACCOUNTANCY EDUCATION; LAW, EDUCATION IN; MEDICAL AND SURGICAL EDUCATION; MINISTRY, EDUCATION OF; PHARMACEUTICAL EDUCATION; TEACHERS, TRAINING OF; also treated under articles on the separate national systems, *e.g.* FRANCE, EDUCATION IN; GERMANY, EDUCATION IN, etc.

Examinations mentioned up to this point have been qualifying tests to ascertain whether a candidate has reached a definite standard. A further extension of this is the competitive examination by which candidates are not only required to attain a standard, but are arranged in order of merit, on the basis of which rewards prizes, scholarships, or appointments are awarded. The most common use of this type of examination is to fill positions in government or municipal service. Civil service examinations, however, have been established comparatively within recent years in most countries. (See further PUBLIC SERVICE, EDUCATION FOR.) The competitive system is also used in most countries to secure places in the government institutions which prepare for the respective armies and navies. (See MILITARY EDUCATION; NAVAL EDUCATION.) Scholarships (*q.v.*), exhibitions (*q.v.*), fellowships, and other academic prizes are also awarded by some form of competition.

But it has always been in connection with the work of the school that examinations have been most frequently employed. Here they may be used periodically as part of the classroom routine to test the amount of knowledge retained by the pupil in a certain field (see REVIEW EXAMINATIONS), or at stated intervals to test the ability of pupils to proceed to more advanced work (see GRADING AND PROMOTION). In both cases, however, the work of examining is entrusted in most instances to the teacher who has charge of the class, or else is conducted by the principal of the school, when the examination is as much a test of the teacher as of the pupils. Examinations conducted by external bodies have been employed for various purposes, (1) by state authorities to test the quality of work done by schools as a basis for the payment of grants. This pernicious system prevailed in English elementary education for many years, and is still the basis of payment in Ireland for secondary education. (See APPORTIONMENT OF FUNDS; (2) by state or other authorities, *e.g.* universities, professional associations, etc., as a test of the ability of pupils who are leaving the secondary school, to enter on higher studies or merely as a test of the knowledge already acquired. Under this type of examinations come the college entrance examinations (*q.v.*), school-leaving examinations, as for example the *Abiturientenprüfung* (*q.v.*, and GERMANY, EDUCATION IN), and the baccalaureate (see FRANCE, EDUCATION IN). Below a statement is given of the different examining bodies in England. In the United States there is a tendency at present to supersede such entrance examinations by a system of accrediting (*q.v.*), first introduced by the University of Michigan in 1871. (See COLLEGE ENTRANCE BOARDS; COLLEGE REQUIREMENTS FOR ADMISSION.)

In Germany and America the tendency has been to limit the number of examinations so far as possible, and by building up a strong teaching profession and system of inspection to accept the decision of the teacher on the question whether pupils have attained required standards or not. In France every step in the educational progress is marked by some form of state examination. In England a system of inspection and better trained teachers has taken the place of examinations in elementary schools. But in secondary education a multiplicity of examining bodies still remains, and since England is typical of an extensive system of examinations, this is described below in some detail.

English System of School Examinations.— The beginning of the method of examination, as we now understand the term, was in the sixteenth and seventeenth centuries, and is most clearly to be traced in the records of the Merchant Taylors' School, London. This school was founded in 1561, and in 1562 the first examination was held. It was a "solemn visitation" of the diocesan. Bishop Grindal and other learned men came to the school to examine "first the ushers and afterwards the forms." The ushers were questioned each as to his learning and his manner of teaching. Then the boys were questioned, form by form. The headmaster was Richard Mulcaster (*q.v.*), and the report of the examiners was commendatory, on the whole, the only reserve being that the staff, being northern men born, had not taught the children to speak distinctly, but that some of the boys showed attainments equal to those of any school in the realm, "which gratifying intelligence was quickly conveyed to Mulcaster, then lying sick, and was received by him with cheerfulness and gratitude." In 1564 Grindal again appeared, accompanied by Dean Nowell and other learned men. A boy named King gave before them a pithy and eloquent oration. Other boys presented verses, and then began the appositions of the chief four forms and an examination of the three ushers. The proceedings lasted from eight in the morning till five in the afternoon, with an interval for "a repast." These visitations or examinations were made usually once a year. In 1572 there appeared the Bishop of Winchester with Dean Nowell and again "other learned men," and the examination was more searching and comprehensive than hitherto. Before a considerable gathering of "venerable" men "the head scholars of the school presented themselves for examination; and after one had briefly enumerated the several books they were learning in Latin, Greek, and Hebrew, Nowell began the examination by directing the lowest of that form to declare the sense and construction of a particular ode of Horace, which from one to another he prosecuted through the whole number, until the captain, requiring diversity of phrases and variety of words and finally omitting nothing which might seem needful for the trial of their learning in the Latin tongue. After him Watts (Archbishop of Middlesex) examined the same boys in Homer as to their skill in Greek, which was his favourite language, and then Horne tried them in the Hebrew Psalter. In all which exercises, they were well allowed." Dean Goodman (founder of the Ruthven Free School, 1595) then examined the next form in Cicero's *Tusculan Disputations.* It was customary to elect, from the knowledge shown by the scholars on these occasions, scholars for St. John's College, Oxford. In 1586, Mulcaster resigned the headmastership, but in 1602 he again appeared at Merchant Taylors' School but, as one of the examiners assisting Dean (afterwards Bishop) Lancelot Andrewes, and took part in the "appositions." Then the four principal scholars pronounced orations, the captain and the second scholar in Greek, the third and fourth scholars in Latin. Mr. Gwyn (Doctor of Physic), one of the examiners, made a learned answer to the captain's oration. Sixteen of the principal scholars were then examined and a theme given them to write whilst the examiners went to dinner. Three scholars were then chosen for St. John's College, Oxford. In 1601, after forty years' work, the school statutes were revised and it was decided to recommend a "probation" of the school three times a year. This probation was to be made by the master. The testing was to last a day from half-past six in the morning till eleven, and from 12.30 till five o'clock in the afternoon. All forms were to be examined in writing. Precautions were to be taken against prompting and copying. No dialogue, epistle, theme, sentence, or verse was to be set twice in the same year. Ample time was to be given to all. But failure to do the exercises well (by any negligence or lack of ability) for these probations was to result in dismissal. A register of the school's probation was to be kept, in it to be entered the name of each boy in each of the six forms, length of stay in the school, what books he had read and how far in them he had read, and a record of his exercises. A comparison was thus to be made, and a permanent record kept, of progress from Probation Day to Probation Day. The master and his three teachers were to receive 6*s*. 8*d*. each for their work in examining.

The governors of the "greatest school in England under one roof" committed the examination to the masters "without any association" with them of outside examiners; first, because of their assured confidence in them; secondly, because the presence of strangers would hinder boys; thirdly, because, if a strange assembly were present, they would take off the master's attention as well as distract the minds of the boys. Thus the Visitation (*q.v.*) of the school by the Diocesan led first to oral examination by the bishop and other learned men, then to the probation by the headmaster and teachers themselves, to be reviewed by the bishop or visitor and the Court of Governors and their friends. The examinations were the preludes to the choice of scholars for the university. With the visiting of the examiners and the governors, there sprang up the idea of a school show day, the Declamation Day, as it was often called, to which governors, parents, and those interested in the school, either magnates or the public, came that all might rejoice together in the performances of the pupils. It will be seen that the plan of probation at Merchant Taylors' School embodies examinational ideas for which reformers have still to plead to-day: confidence in the masters to conduct their own examinations, a style of examination devised to bring out active and initiative powers of pupils even more than to test mere retentive capacity, and the work required in examination to be qualitative rather than quantitative. This latter feature is the more noticeable, seeing that the curricula of the schools in classics was so extensive. Perhaps the most remarkable point in the Merchant Taylors' scheme is the inclusion of the register of the school's probation. It is not improbable that this plan has the future with it. For it is a recognition of comparison not only of pupil with pupil, but of the ability of a pupil at one probation with his ability at the next and following probations. It is thus often material for considering the progress of ability as well as the attainment of a standard of knowledge. It shows the power of using knowledge at entrance, and all along the line of the pupils' course, three times a year, and is an indication of educational process in the individual, instead of being mainly concerned with competitive merit and relative position in an order of merit according to some objective standard of attainment.

Examinations of school were required by the statutes of St. Saviour's Grammar School, 1562, Tonbridge, 1564, Oundle School, 1566, St. Albans, 1570, Sandwich, 1580, and Codwell (Herefordshire), 1612. The system was therefore established in schools by the time of the sailing of the Pilgrim Fathers.

It was not until the second half of the nineteenth century that the examination system which marks English education received its fullest development, until at the present day the multiplication of examinations and examining bodies has given rise to a situation which is leading to a reconsideration and reform of the system. But whatever arguments may be adduced in favor of or against examinations, thus much may be said by way of preface, that English education could never have reached the present stage of development without the influence of the system, pernicious and exaggerated as that may have been. Both in elementary and secondary education the examinations helped to standardize schools and curricula; they introduced new branches of study, and kept teachers, who would otherwise have been inefficient, to certain easily formulated and definite standards, however faulty and objectionable these may be in the light of later educational theory.

Elementary education was submitted to the controlling influence of examinations by the action of the Rt. Hon. Robert Lowe, who in 1861 introduced payments by results as the most mechanical and ready method of measuring efficiency. All children over six years of age in the elementary schools were to be examined individually once a year in the three R's, standards being arranged according to age. Government grants were paid according to the results and tendencies. A minimum of education was thus secured to children of all abilities, but a monotonous uniformity was introduced. Teachers were not only stimulated by the prospects of the grant, but were placed at the mercy of local managers to whom the grants were directly paid. The system made every pupil rote perfect in the three R's. One inspector even went so far as to say that "the studies of the classroom must be those wherein progress can be definitely measured by examinations." Another inspector, in dictating out of a reader which had been used by the school, changed some of the words, but found on marking the papers that the pupils had not noticed his changes, and evidently had learned the book by heart. Great care was taken by managers and teachers to make a good showing on the day of inspection; the premises received vigorous cleaning, and the children were strongly urged to appear with clean hands and faces and in their best clothes.

The system did not continue without considerable opposition from those interested in education. Matthew Arnold (*q.v.*), himself an inspector, reports " That the mode of teaching in the primary schools has fallen off in intelligence, spirit and inventiveness," owing to the introduction of the mechanical processes. Slight modifications were made in the system; the amounts of the grants were altered; additional grants were given for " specific subjects " (geography, history, algebra, geometry, and any other scheme of work approved by the inspector); examinations of Standards I and II were abolished in 1873 and 1874. The Royal Education Commission of 1886–1888 recognized that some doubt was expressed whether the system of examinations fosters a healthy feeling, and was inclined to believe that overpressure both of teachers and pupils was caused. The majority held that " so long as a money value is attached to each success in the individual examination of the children attending any elementary school, and so long as the teachers are dependent on the grant for part of their income, there is great risk that teachers, in considering their own reputation and emoluments, may endanger the health and welfare of the children." In the same period an agitation was conducted in the press (see *Nineteenth Century*, November, 1888, and February, 1889) on the whole question of examinations, and Mr. Auberon Herbert published a collection of letters under the title *The Sacrifice of Education to Examination* (London, 1889). As a result individual examinations were abolished in 1890, and " examination by sample " was introduced, by which the inspectors could examine different parts of a class in different subjects. In 1895 inspectors could visit schools without previous notice. By 1897 the system of payment by results was abolished, and with it the system of wholesale examinations at the hands of the government.

A similar system of examinations and payment of grants on the results was employed by the Science and Art Department, which made payments to schools for pupils winning prizes; at first only six subjects were offered for examination, and this number was gradually raised to twenty-six. Elementary school teachers qualified themselves by obtaining the department certificate, and by teaching science subjects in the evening were able to secure the grant. The system encouraged the rise of schools of science and the teaching of science and art subjects in secondary schools. Payments by results were abolished by the Department in 1895.

In the two systems so far mentioned there was at any rate a certain amount of uniformity in standards of requirements and in organization. But it was in the field of secondary education that the tyranny of examinations and examining boards with different standards, requirements, organization, and dates was felt. In 1853 the College of Preceptors (*q.v.*) began a system of examinations in secondary school subjects (Latin, French, English, history, mathematics, geography, drawing, some science, and Greek). The examination was open to both boys and girls, and certificates were given on the results. The examinations were held twice a year at local centers. In 1858 the Society of Arts, which in 1852 had formed a union of mechanics' institutes, proposed to hold examinations of persons over fifteen years of age on leaving school in mathematics, English, history, Latin, French, and German; in 1873 technological examinations were added, but were transferred in 1879 to the City and Guilds of London Institute. In 1858 Oxford undertook the examination of pupils in secondary schools through a body of delegates, and gave the degree of Associate of Arts to successful candidates; girls were admitted in 1870. Cambridge also instituted a system of examinations for boys only in 1858, and extended it to girls, who were allowed to take the papers in 1863, and in 1865 were placed on the same footing as boys. Preliminary sections for pupils under fourteen were also instituted. Centers were established not only all over Great Britain and Ireland, but also in the colonies. The two universities held their examinations at different times of the year. When in 1869 there seemed a possibility that a government examination would be established for secondary schools, as a result of the Endowed Schools Act, the headmasters at their conference in 1870 urged the universities to take up the work and to grant leaving certificates which would exempt from entrance examinations to the universities. The result was the establishment of the Oxford and Cambridge Schools Examination Board, or the Joint Board, in 1873. Girls were admitted to the examinations in 1878, and in 1882 a junior certificate examination was instituted. The papers were marked by the masters of the schools, and were reported on by the examiners. London University held its first examination in 1838, which included arithmetic and algebra, English history, geography, Greek, Latin, chemistry, natural history, geometry, and classical history. Students took first the pass papers and then honors. At first the examination was limited to students in affiliated colleges of the university, but in 1858 was thrown open. This examination continued to increase in difficulty, and complaints were heard from schools until the requirements were revised in 1898. When the University of London, by act of 1898, again became a teaching institution, the external examinations for external students were retained. Local examinations are also conducted by Durham, Birmingham, Manchester, Liverpool, Leeds, and Sheffield universities, the last four being combined as a Joint Matriculation Board. The University of Wales and the

Central Welsh Board also hold examinations for matriculation and leaving certificates. Other examining boards are the London Chamber of Commerce, the City and Guilds Technical College, and the Lancashire and Cheshire Institute, which are concerned mainly with examinations in technical and scientific subjects. This does not exhaust the list of examinations or examining bodies; Oxford and Cambridge in many cases insist on candidates passing either in whole or in part the Responsions and Previous Examinations, while their colleges may insist on an additional matriculation examination. Further, none of the above examinations usually count anything toward scholarships or prizes, nor toward the examinations for entrance into the training schools for the army and navy (Woolwich, Sandhurst, Osborne) or into the civil service. The different branches of the public services have their own entrance examinations, which have led to the establishment of numerous "cramming" institutions. One of the evils of the examinations for the lower branches of the civil service is that boys and girls tend to leave the regular secondary schools for the crammer.

It is only within recent years that exemptions have been accepted by professional bodies, by which a certificate of success in any of the recognized university examinations is accepted in lieu of their own preliminary examinations. But many of them still provide their own examinations. Among these may be mentioned: the Institute of Chartered Accountants; the Society of Incorporated Accountants and Auditors; the Institute of Actuaries; the Royal Institute of British Architects; the Institution of Civil Engineers; the Law Society; the General Medical Councils; the Pharmaceutical Society of Great Britain, etc.

The evils of overexamination are, however, beginning to be slowly recognized. In 1903 the Consultative Committee of the Board of Education recommended, after conferences with several associations representing teachers, the establishment of a representative central board to coördinate and control standard of examinations and to secure the interrecognition of certificates. (See Board of Education, *Circular*, July 12, 1904.) Inspection, both by universities and by the government, is gradually increasing in extent and importance. Universities are coöperating with each other and combining to reduce the multiplicity of entrance and preliminary examinations, and professional bodies are recognizing equivalents and granting exemptions in these. The external examinations and their attendant evils are supplemented by the number of examinations held within the schools by the teachers. Each term is concluded by an examination in all the work immediately preceding. Promotions from one class or form to another depend on the results of the term examination. Increasing attention, however, is being drawn to the importance of relying on the teachers' testimony on a pupil's work and on the pupil's record in the classroom rather than on the results of an examination, which may be vitiated through several causes.

The advantages and disadvantages of examinations have been frequently discussed, and several points stand out clearly. That they are hygienically harmful to the majority of pupils is shown in detail in the following article (EXAMINATIONS, HYGIENE OF). The limitations of the English system of elementary education were eloquent proof that examinations do not constitute a satisfactory basis for the distribution of money grants to schools, nor do they secure the results which are aimed at — general educational efficiency (see APPORTIONMENT OF FUNDS). Examinations cannot provide the best kind of motives for study, and do not secure the proper type of interest in school work; the stimuli afforded are adventitious and artificial. Too many accidental conditions may enter into examinations which may counteract their value as tests. Further, an examination over a large area cannot be addressed to the individual. Frequently success in examinations may be due, not to innate general ability, but merely to retentive powers. Above all, external examinations disorganize school work and tend to limit the good teacher and to reduce all teaching to a dead level of uniformity, and in most cases must result in cramming. That the evils which follow in the train of competitive examinations for public service appointments are less harmful than the old system of nomination by political influence is obvious; but another question arises, whether national efficiency is secured by the present means. There is a tendency in England at present to introduce more widely a system of oral examinations such as has been employed recently by the Admiralty to secure officers for the navy, and by the West Riding Council in the award of scholarships. The whole question of whether success in examinations is followed by success in after-life is one that has never been submitted to scientific investigation. F. W. AND I. L. K.

On the use of examinations as a classroom procedure for review, see REVIEW EXAMINATIONS; METHOD; RECITATION.

EXAMINATIONS, HYGIENE OF. — In recent years there has been a strong movement for the abolition, or at least the limitation, of school examinations on account of the many evils, hygienic and pedagogical, that seem to be inevitably connected with such tests. There seems to be, however, a fairly general consensus of opinion that examinations of some kind are necessary, and hence the hygienic aspects of the subject are of special importance.

Hygiene is concerned both with the direct results of examination in their bearing upon the health, and also with certain secondary and indirect results of examination. The data in regard to the direct effect have accumulated in great abundance. Examinations are often the cause of overpressure, and serious physical disorder is not infrequently produced by the strain of preparation and of performance. Especially in England, Germany, and other European countries has this been the case. Studies in Russia, where examinations often extend over a period of several weeks, have shown loss of weight and other indications of physical strain in pupils at such periods. In Germany fear of examination has been found to be frequently one of the causes of suicide among school children.

In this country we have no results of special investigations concerning the effect of examination on the health of school children, but the reports of innumerable observers show that frequently there is dangerous nervous strain; and that even the best students often cram before examinations in an unhygienic manner will be hardly denied by any who are young enough to recall their own student days. In great universities in this country the writer has seen mature students of industrious habits become more or less abnormal, not to say pathological, in their mental activity on the eve of examination, and exhibit the phenomena of overfatigue during the examination itself. The pressure of examination is likely to fall hardest on those who least need the stimulus, and instances of overwork before examination are not rare among the best students. Considering the matter from the standpoint of psychology, such violent mental athletics are both wasteful and injurious. Modern psychology and psychiatry make plain the need of regularity in intellectual work and the danger of any kind of abnormal mental activity. The unnatural method of study on the part of the examinee of which the protestants in the *Nineteenth Century* complained is all too prevalent in this country. The evil here may be less in degree, but it is of the same kind.

There are, besides, certain secondary results of examination which are distinctly evil, as they tend to produce habits of unnatural and disorderly thinking. Some of these are illustrated by experimental studies that have been made in Germany. Lobsien has made interesting experiments on the psychology of school examinations. He wrote on a blackboard twenty simple examples in arithmetic. Fifty-four boys of the age of eight were tested by him. The experiment was made twice. The test of normal conditions was similar to an ordinary study hour in arithmetic with silent reckoning. Before the beginning of the special test the children were told that their work would be considered as an examination and as the basis for their marks. The result was as follows: With the normal test there were 39 per cent of the examples wrong; with the special test 50 per cent. The effect of the examination was to cause confusion of association and error. Lobsien made also a similar test with dictation exercises. The results corroborated those of the first experiment. In all cases the examination injured the character of the performance, and especially in the case of the poor pupils. Lobsien extended this experiment also to the qualitative errors. The greatest number of errors, namely, 42.7 per cent, occurred in cases of words which came under definite rules. Plecher has more recently made experiments to test the results found by Lobsien, although without testing the character of the errors, and has found similar injurious results. Indications of emotional strain were also found. That these conditions of anxiety were actually present was proved by an experiment which Plecher performed with thirty-eight children twelve years of age in a class of *Sexta* of the common school. Some days after the official examination at the close of the year, he had the pupils prepare a so-called free essay in regard to school examinations. Of thirty boys, twenty-nine testified to the presence of a feeling of anxiety, of course in the most varied forms of expression: " I do not trust myself to speak "; " I am glad of the examination, but when the *Herr Oberlehrer* comes, I am afraid "; " If I reckon, for example, two hours, I quite lose my senses." One pupil wrote, " If it is stated that we have an examination to-day, then a great dread comes over me, because I always think I shall do everything wrong. The thought always keeps working in me, and then with the best of will, I can do nothing. When we are through, then the anxiety no longer remains."

Equally bad, perhaps, are the habits of study fostered by preparation for examination. It is a mere commonplace to say that in many schools the best preparation for an examination is to have in memory a vast number of details. The student may enter the examination in such a condition of brain fatigue that he would find it difficult to solve a simple original problem; but if he have this plethoric memory of details he will succeed. A good memory, as Helvetius said, is a phenomenon of order. The normal mind, like the good householder, has its possessions stored away in various closets, drawers, and pigeonholes, or, in technical terms, in various association complexes; the student prepared for examination is like the unfortunate man who must move at a sudden alarm and has all his goods piled together at the street door ready for the truckman. Normally much of our knowledge is unconscious. Even what we cannot remember is not wholly lost. Ebbinghaus in his experiments in memorizing nonsense syllables found that even where the memory of a series of syllables was so evanescent that after an hour it could not be recalled, a certain hidden skill persisted unconsciously, so that the same series could be relearned, even after the interval of a month, in much less time than a new series. Forgetting is a normal function of the mind. We retain comparatively little that we have learned, except main principles and this unconscious element. The latter, however, is valuable. It is this that makes us feel at home in a subject. At the end of a college course a large part of one's acquisition is of this kind; the ordinary examination cannot gauge it, but puts a premium upon abnormal mental activity.

Hygiene requires that examinations should be given for the sake of the students, and not in behoof of an institutional standard. Apart from examinations at graduation and the like, the chief reason for formal tests is to determine a pupil's fitness for doing profitably a higher grade of work. When this can be determined without examination, a formal test is unnecessary.

The famous German educator, Professor Paulsen, has enumerated the rules which should govern examinations from a pedagogical point of view. There is an almost equally good code of rules from the point of view of hygiene for avoiding the evil secondary results of examination. They are in part as follows: "(*a*) Look for the positive acquisitions of the student. Examination as such has the opposite tendency — it gives prominence to the deficiencies. (*b*) Begin with easy, simple, definite questions. The missing of a question and answer in the beginning frequently confuses and upsets the whole affair. (*c*) Treat errors and blunders in accordance with Galatians vi, 1: 'Brethren, if a man be overtaken in a fault, ye which are spiritual restore such an one in the spirit of meekness, considering thyself lest thou also be tempted.' (*d*) Do not forget that for most men an examination does not afford a good opportunity to appear in a favorable light; for this reason subjoin, as occasion may require, *additis addendis*."

The special demands of hygiene in regard to examination may be summed up briefly and dogmatically as follows: (1) No formal written examination should be given in the school below the sixth grade. (2) Examinations below the high school should not be more than forty minutes in length, and in the high school they should not be more than one hour in length. In colleges, higher technical schools, and the like, no examination should last more than three hours. (3) Not more than one examination should be given on the same day in the public schools; and in the colleges and higher schools not more than one three-hour examination or two one-hour examinations should be given on the same day. (4) Periods of examination extending over several weeks, as in some European countries, should not be permitted. (5) The sanitary conditions of the examination room as regards adequate light, good ventilation, suitable temperature, and adequate humidity of the air should be always provided for. (6) Hygiene joins with pedagogy in emphasizing the advantages of examination questions which test ability and power of straightforward thinking over examinations that put a premium on cramming, *i.e.* original problems, translations at sight, the writing of original themes, and the like.

W. H. B.

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EXAMINATIONS FOR TEACHER PROMOTION. — See Teachers, Promotion of.

EXAMINATIONS, PUBLIC. — See Examinations; Exhibitions, School.

EXAMINERS, BOARDS OF. — State, county, and city boards of examiners exist in many places in the United States, for various purposes, such as the auditing of accounts, the approval of contracts for work performed, the inspection of public institutions, the examination of candidates for certificates to teach, etc. From an educational point of view boards of examiners mean only the latter two, and usually only the last. Boards of examiners for institutions are not found with any frequency, and only as boards of inspection for higher institutions and for a few city school systems. A board of educational examiners is appointed each year for West Point, Hampden Normal Institute, and a few state normal schools and eleemosynary institutions; and the boards of school visitors commonly appointed each year in the New England towns are forms of boards of examiners. The principle of inspection and approval by outside bodies is little used in the United States, the conduct of institutions being entrusted almost entirely to boards of trustees, governors, or regents (see BOARDS OF CONTROL) in the case of institutions, and to the boards of education, boards of school commissioners, or school committees in the case of our city systems. By the term "board of examiners" is usually meant boards which examine and certificate those who wish to become teachers in the public schools. Such boards are of three kinds, — state, county, and city or district.

State Boards of Examiners. — One of the best examples of this type is to be found in Alabama, where a State Board of Examiners has been constituted by law, consisting of the State Superintendent of Education, and four others appointed by him for four-year terms. This board prepares all questions for the examination of all teachers in the state; appoints persons to conduct examinations for them in each county, and to transmit the answer papers to the State Board of Examiners; examines and grades the papers of the applicants, and issues to those who pass teachers' certificates of three grades, the grade varying with the percentage made in the examination, and also life certificates to those who have proper qualifications; keeps a record of all certified teachers in the state; and may revoke any certificate for cause. Even graduates of the state normal schools must take the examinations. All certificates issued are valid to teach in any county in the state. A similar State Board of Examiners is to be found in Arizona and in Wyoming, except that in Wyoming the State Superintendent of Public Instruction is not a member of the examination board. In Connecticut, West Virginia, and a few other states the State Board of Education acts *ex officio* as a state board of examiners, the State Superintendent of Education doing most of the active work. In a number of states, as for example Indiana and Oregon, the State Board of Education acts as an examining body only for life diplomas or state professional certificates, or both, all other certification being left to the county or local school authorities. The tendency within recent years has been to increase the number and the powers of such central certificating bodies.

County Boards of Examination. — In a large number of the states all county teachers' examinations are given by the county superintendent of schools, either using questions prepared by him or by the State Superintendent of Public Instruction, or by the State Board of Education; and then certificates to teach in the schools of the county, often of different grades and periods of validity, are issued by him. In ten states a special county board of examiners exists, and in about an equal number of states, mostly in the South and West, the county board of education acts *ex officio* as a county board of examiners. In either case it is customary for the board to prepare all questions, examine the candidates for teachers' certificates, grade the examination papers, grant the certificates to teach, and issue all certificates granted on the basis of credentials coming from other counties or states. Such boards are usually paid a *per diem* for their services, and the members appointed are usually successful teachers in the county.

City Boards of Examination. — In many states, particularly in the eastern part of the United States, the larger cities are permitted to examine and certificate their own teachers, independent of the county or state examining system or systems; and in other states the cities, while accepting the county or state certificates so far as they go, superimpose a city examination, usually of both a pedagogical and a personal nature, as a further test of fitness. To conduct these, special city boards of examination have usually been created, though in some cities the city superintendent of schools conducts the examination. In a few large cities, such as New York, special city boards of examination have been provided, the members of which devote most or all of their time to the work. In smaller cities, as for example Dayton or Jersey City, the city superintendent of schools and from two to four others, usually principals or teachers in the schools, examine all applicants and grant all city teachers' certificates. The additional members are sometimes appointed by the superintendent, more commonly by the board of education on the recommendation of the superintendent, and sometimes include one member of the board of education itself. In nearly all cases where separate city certificates are required they represent a higher standard of education and professional training and experience than do the regular county or state teachers' certificates. As state standards rise, the tendency is to dispense with the separate city test. In a few cities, as for example San Francisco and Los Angeles, the city accepts the state or county certificates at their face value, so far as they go, and then superimposes an additional educational and personal test, to enable it better to select teachers of larger capacity and greater personal skill. In these cases the city board of examination consists of the superintendent and such persons engaged in educational work as may be designated to assist him in conducting the special city examinations.

Town Certificates. — In the towns of some of the New England states, as for example Massachusetts, the town certificate takes the place of the state or county certificate, found elsewhere. Here the town school committee (board of education) examines as well as employs all teachers. In the larger towns this passes over into a city board of examination, by the delegation of authority. E. P. C.

See CERTIFICATION OF TEACHERS, and the articles on state and city systems.

EXAMPLE. — In the teaching of arithmetic an "example" is a sample problem set by the teacher to illustrate the principles of mathematical calculation. More frequently the "example" is a typical exercise in which the pupil applies and drills his knowledge of arithmetic. In the current usage of teachers the "example" is frequently contrasted with the "problem," the distinction being that one is an abstract and symbolical statement of numerical facts, and the other a concrete and descriptive statement. The "example" is usually completely expressed in mathematical symbols, and the "problem" is commonly stated in words. The expression "clothed problem" (from the German) is occasionally used to mean what is here designated as "problem," and "abstract problem" is used to mean what is here designated as "example." In the case of the example, the mathematical sign tells the child what to do, whether to add, subtract, multiply, or divide ; the "example" being a kind of prereasoned problem, the pupil has only to manipulate according to the sign, his whole attention throughout being focused on the formal calculation. In the second case, the child has two distinct functions: he must, from the description of the situation presented, decide through the process of reasoning what he is to do (add, subtract, divide, or multiply), and having rendered his judgment, he must proceed through the formal calculation.

As the "problem" involves two types of mental processes in a single exercise, and the "example" but one, the usual procedure in teaching is to take up the formal side through "examples" first, and, later on, the applied side through the use of problems. This means that the first emphasis is on formal and abstract work rather than on a treatment of natural, concrete situations, an emphasis not wholly sanctioned by modern psychology and the better teaching procedure of other subjects. The better practice, found particularly in the primary grades, is to begin new difficulties through a concrete, objective presentation of problems, then pass to the formal work of the "example" and finally to a considerable use of the applied "example" or "problem." The abruptness of transition from objectified problems to the formal work implied in "examples" is broken by the use of "number stories" which are descriptions or narrations of easily imaginable situations or events. H. S.

See ARITHMETIC ; PROBLEMS.

EXCEPTIONAL CHILDREN. — For a time there was a tendency to look upon exceptional children as being separated in a well defined way from normal children, and special educational procedures were provided for them. In recent years, however, closer analysis has shown that a very large number of children diverge more or less in particular respects from the normal, but not in a degree to deserve the designation "defective" or "abnormal." It is now a well recognized fact that in all schools a considerable number of children vary sufficiently from the normal to deserve special recognition and some form of special educational treatment. Courses of study and programs must naturally be devised for the large number who are normal in capacity and attainments. Such courses of study and programs, of necessity, fit more or less badly children who vary from the normal. A more efficient and sympathetic education is steadily endeavoring to discover and classify cases of educational misfit, and to produce forms of education suited to them.

Exceptional children present many different types of variation. Sometimes this is due to recognizable causes of a physiological nature ; in other cases the differences spring from hidden sources, and manifest themselves as dullness, slow reaction time, incapacity for abstract thinking, precocity along special lines, and an unbalanced condition of certain instincts, like those of aggressiveness, concealment, and fear. No sufficient analysis has yet been made to show how far conditions of inheritance and conditions of environment are respectively responsible for the development, on the one hand, of exceptional characteristics, and on the other, for the suppression of certain normal tendencies.

In this connection, it should be noted that qualities which later make for extreme delinquency or defectiveness may, if dealt with in time, be adjusted ; for example, special schools exist for the custody and training of delinquents ; but a keener educational discrimination is now seeking prospective delinquents in their incipient stages, with a view to the early application of purposive measures. There is a widespread conviction that a more perfect knowledge of pedagogy would enable schools at an early stage to detect and educate to better advantage those who later become known as dullards, backward children, and abnormally precocious along special lines.

Under ordinary schoolroom conditions, the educational treatment of exceptional children is now being met in some measure by the provision of flexible grading and promotion (*q.v.*). Different groups of children are selected with a view to allowing them to make progress through the course of study at different rates; and, to some extent, the work may be modified for each group with a view to taking advantage of educational peculiarities. Again, some schools allow certain adjustments within the course of study itself by exempting exceptional children from requirements that may be appropriate for normal children. Subjects like grammar and the more advanced arithmetic requiring capacity for abstract thinking may be omitted, or deferred by certain pupils who seem incapable of good work in this direction; on the other hand, artistic or musical talent beyond the ordinary may be encouraged. Another device, proving effective with some exceptional children, is the provision of a large amount of concrete or practical work. There now seems little doubt that many so-called exceptional children are capable of considerable educational development from experience with tools and concrete materials. The truant schools of England are finding this industrial work an exceptionally useful medium for the development of certain types of children who vary from the normal. (See INDUSTRIAL EDUCATION.)

While probably many other developments suited to exceptional children will be introduced into courses and programs in such a way as not to involve any segregation of such children, it is important to note that special classes, ungraded classes, and more or less segregated schools are at the present time serving best to illustrate the needs and advantages of educational procedures adjusted to the needs of these children. Whenever a special group of children can be isolated, such as the unmanageable, the tuberculous, the crippled, the mentally defective, and those deficient in one or more of the special senses, it becomes a simple problem to evolve special educational means adapted to them. Where children similarly exceptional, but in a lesser degree, are retained with children pursuing the usual program, anything like individual consideration is difficult, and apt to be occasional. The same applies to children that, in one or more directions, present more rather than less of native or acquired capacity. It would appear, therefore, that current tendencies look to a further segregation, of a temporary nature, at least, of children requiring special treatment.

Systems of education, particularly in cities, have long tended toward a highly mechanical organization. Child study and a close consideration of educational results now constantly suggest flexibility and adaptation, and it becomes a problem of administration to provide for educational adjustment of this sort, without incurring for the children the penalty of social segregation. The special education of the deaf has long been considered a necessity, but in Chicago schools the attempt is being made to carry on a part at least of this education where the unfortunate children may have the advantages of contact with those in full possession of their senses. Classes for crippled children may not be so far isolated that such children have no contact with those of normal development. The complete detachment of the delinquent or truant may produce some results more than offsetting the advantages of the special educational treatment given. It would appear that current tendencies are in the direction of the formation, to an increasing extent, of classes or other special opportunities for the development of the peculiar education most needed by exceptional children, on the one hand; and, on the other hand, the provision of means whereby, for purposes of social contact, such children may be kept in harmonious touch with the home, school, and street environments. Contemporary educational theory insists that education shall consider the individual; and the necessities of administration demand that, within limits, like individuals be gathered together. The broader educational view, however, recognizes that formal teaching is but one part of the education of exceptional children; the other part is to be found in the conservation, as far as practicable, of a normal environment suited to childhood. D. S.

Under the discussion of special forms for the education of exceptional children will be found such topics as: DEAF, EDUCATION OF THE; DEAF-BLIND, EDUCATION OF THE; BLIND, EDUCATION OF THE; BACKWARD PUPILS; IMMIGRATION AND EDUCATION; CRIPPLED CHILDREN, EDUCATION OF; NERVOUS CHILDREN, EDUCATION OF; SUPERNORMAL CHILDREN; TRUANCY AND DELINQUENCY; TUBERCULOUS CHILDREN, EDUCATION OF; SPEECH DEFECTS, EDUCATIONAL TREATMENT OF; OPEN-AIR SCHOOL; RETARDATION AND ELIMINATION OF PUPILS; SPECIAL CLASSES, etc.

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EXCEPTIONAL CLASSES, EDUCATION OF. — See EXCEPTIONAL CHILDREN.

EXCHANGE OF TEACHERS AND PROFESSORS. — See INTERNATIONAL EXCHANGE OF TEACHERS AND PROFESSORS.

EXCLUSION FROM SCHOOL. — While exclusion from school must be determined with regard to law, hygiene makes certain demands, on the principle that what is necessary for the welfare of the school will ultimately be sanctioned by the law. The causes for which exclusion is deemed necessary for the health of the school are chiefly the following: measles, scarlet fever, diphtheria, tonsilitis, whooping cough, mumps, chicken pox, pediculosis, septic inflammations with offensive odor, itch, and sometimes other skin diseases; the specially virulent diseases, such as syphilis, leprosy, and smallpox; in some cases tuberculosis, grippe, and colds; also certain nervous diseases and mental disorders, where there is danger of psychic contagion or serious interference with school work, such as epilepsy, chorea, hysteria, and certain extreme sex perversions; and, finally, most cases of feeblemindedness.

In many of these cases exclusion from the school is unnecessary and unwise, if special classes can be provided for those afflicted. In cases of hysteria, for example, the discipline and care of the school is a great advantage; and in case of tuberculosis, where outdoor classes can be provided, the school is likely to be an aid in the care of the disease.

Sometimes it is necessary to exclude healthy pupils for the welfare of the school, notably cases of extreme moral delinquency and the carriers of disease. For example, whenever a case of diphtheria breaks out in a school, those pupils who are found by culture tests to be harboring the Klebs-Loeffler bacillus, the germ of diphtheria, should be excluded from the school. It is customary also to exclude the brothers and sisters of children who have contagious diseases. In all cases where healthy pupils must be excluded, special classes should be provided for them if possible.

In clear cases of diphtheria, scarlet fever, measles, and the like, the necessity for exclusion is obvious. In doubtful cases the question of exclusion should be decided by the school physician, or, where there is no such official, the advice of a competent physician should be sought by the teacher or superintendent. Readmission to school also should be by the advice of a physician. W. H. B.

See ATTENDANCE; CONTAGIOUS DISEASES; MEDICAL INSPECTION; SCHOOL MANAGEMENT; TRUANCY; JUVENILE DELINQUENCY; and articles on the different diseases.

EXCURSIONS, SCHOOL. — A term applied to journeys of longer or shorter duration taken by school children under the direction of teachers, primarily for purposes of instruction. Historically the school excursion may be connected with the wandering and begging students of the Middle Ages. The distinct educational value of travel was recognized by most of the writers on education of the sixteenth and seventeenth centuries, including of course Montaigne and Comenius; but here the period of travel succeeded the education of the school, and was not intimately connected with it. More specifically, however, the school journey received its impetus from the work of Rousseau, under whose influence Basedow incorporated the school excursion as part of the work of the Philanthropinum at Dessau; but this failed, with the rest of his efforts, only to be revivified and successfully developed by Salzmann (*q.v.*) at Schnepfenthal. Influenced by Salzmann and Bender, who had made use of school journeys at Weinheim, K. V. Stoy (*q.v.*) introduced the system into the practice school at Jena. The plan received its further development under Professor W. Rein, who combined Ziller's theory on the subject with Stoy's practice, and made the school journey an integral part of the school curriculum. From Jena the plan has been adopted throughout Europe. The short half-day or day excursion is a feature of the German elementary schools. Visits are made to local museums and scenes affording interest from the geographical, historical, and natural points of view, in order to supplement a definite lesson. The longer school journey, as conceived by Professor Rein, serves to focus in a practical way most of the work of the year within certain limits; geography becomes something real when the pupils can see actual concrete instances of what may hitherto have been nothing but names; nature study, geology, botany, become objectified; history receives a concrete background; and the pupils' views and outlook on the world are broadened generally. The world itself becomes a valuable education. School work as developed at present tends too much to be seat and book work. The journey or excursion introduces variety of a valuable character, and teaches the pupil how to educate himself by using his eyes and ears; frequently the backward pupil shows qualities not recognized in the classroom, or the clever pupil finds that he has much to learn in his contact with nature and the world; and both may learn to find pleasure in the open, — a valuable training in these days of crowded town life. Further the contribution to character formation is no slight one; the initiative and freedom which the pupil enjoys is greater than can be possible in the school; the constant contact with other pupils is a valuable social training; while the relations with the teacher can assume another aspect to that in the classroom. Professor Rein's example has been imitated throughout Germany, but more particularly where the Herbartian influences are strongest. In Austria-Hungary, Holland, Denmark, Russia, and England, students of Professor Rein have introduced the school journey as organized at Jena. But other movements of equally educative value have been influenced by these journeys; in Germany numerous societies, some of which are philanthropic, have sprung up to facilitate the traveling of school pupils, but these journeys do not form an organic part of the school work. German pupils can now be found during vacations scattered not only over the whole length and breadth of their own country, but in the Tyrol, in the Alps, in France and England. With the last country a system of exchange of hospitality has sprung up. In France and Belgium the school journey is frequently given as a reward for good work, although in Brussels a school excursion once a fortnight is compulsory. In England the school journey of the Jena type has had a wide vogue and received an impulse from the successful experiments made in connection with the practice schools of the Manchester University, first under Miss C. T. Dodd, and then under Professor Findlay, who instituted the practice of taking his pupils into the country for a period of two weeks in each year. Pupils from English schools, more particularly secondary, are taken into Germany and France; and no doubt the foundations for peace are being laid in thus giving the younger generation an appreciation of their neighbors, without mentioning the educational benefits accruing. The school excursion in the narrower sense of a short journey with an immediate purpose is receiving favorable encouragement from the Board of Education, which recognizes rambles, excursions, and visits for school attendance purposes (*Elementary School Code*, 1909, Art. 44 *b*), and teachers are not slow to avail themselves of this power.

The success of school journeys depends largely on careful preparation and organization. The curriculum of the whole year should unconsciously form a preparation for what is to be seen and visited; more immediate preparation may be given a few weeks before the journey. The pupils should receive directions as to behavior *en route*, the amount of baggage to be brought, and a little preparatory exercise. In most cases the pupils pay their own expenses, which in England and Germany amount to $3 and $6 each. Poorer pupils should, so far as possible, be assisted quietly from some contributions. A holiday savings bank is a good plan in poor schools. While a definite routine should be observed *en route*, it is not necessary that the time-table should be so rigorously observed as to detract from the truly educational value of the journey. Other important features in organizing a school journey are the securing of lodgings, the provision of guide books, which in some cases the pupils may prepare themselves, and the supply of a small medicine chest. The school journey should be rounded off with a general review; and for classroom purposes its value lies in constant reference to it where objective knowledge is required.

In the United States the school excursion has only recently been employed as a means of instruction, though its use is increasing each year. Visits of teacher and class to the parks and museums of cities are becoming more common, and half-day excursions to the country are now employed in some places. An all-day excursion on Saturday has become a regular part of the summer vacation school, such excursions often being made to farms and to points of interest some distance in the country. This form of teaching is capable of much greater use than we have so far given it.

I. L. K.

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EXCUSES. — As one means of preventing and correcting unwarranted absences and tardinesses, the schools usually require written excuses from the parent. Such excuses are mere explanations, the demand for which is devised to check truancy or to reveal defects in home control. They are of very irregular effect in different communities, depending on the compulsory attendance statutes, the firmness of school administration, and community opinion.

H. S.

See School Management; also Records and Reports.

EXEMPTIONS. — In some communities, exemptions from school attendance and school examinations are given to children as a reward for good attendance and high-grade scholarship. The practice is decreasing in the lower schools in particular, owing to the fact that exemption from school duties and opportunities, treated as a privilege or reward, engenders an unwholesome attitude toward two normal functions of school life. When immunity from attendance or examination is regarded as a privilege, it implies an escape from something unpleasant and undesirable.

H. S.

See School Management.

EXERCISE. — See Athletics; Calisthenics; Gymnastics.

EXERCISE, OPENING. — See Opening Exercise.

EXHAUSTION. — See Fatigue.

EXHIBITION. — An endowment for the maintenance of poor scholars, either at a school or at a university. It is one of the most ancient, as it is one of the most extensive of modern, methods of promoting education.

The term is derived from Roman law, and means nothing more than maintenance. It occurs in the *Digest* (XXV, iii, 5) in two citations from Ulpian. "Whether any one is bound to maintain (*exhibere*) those children only who are in his power or also those who are emancipated requires consideration." And (*Dig.* XXVII, xi, 3) "The right of alimony (*alimentorum*) for wards is within the Prætor's cognisance. When an estate is large, the measure of alimony is given not by the size of the estate, but by what is sufficient for a moderate maintenance (*quod exhibitioni frugaliter sufficit*)."

Exhibitions for boys at school appear to date at least from the time of the Emperor Alexander Severus. His predecessors had established public schools; he established exhibitions for poor boys with the condition, repeated in the statutes of Eton College one thousand years later, that the recipients should be free born. In England it is recorded by Herman, Archdeacon of Suffolk, writing *c.* 1070, that King Canute, *c.* 1020, when he went to any noted minster or walled city, sent there boys to be taught at his expense, not only freedmen and the poor, but also freemen's children.

Perhaps the earliest instance of an exhibition in post-Conquest England is in 1176, when the Sheriff of Northampton accounted for the livery (*de liberacione*) of John, a clerk of Eleanor, Queen of Spain, while he was at school at Northampton at the rate of 2*s.* a week (*Pipe Rolls*, 22 to 27 Hen. II). Evidence of a similar royal exhibition occurs in a writ of King John to William of Cornhill, 13 April, 1205, "Make the bearer Geoffrey attend school at Winchester and find him reasonable necessaries. Let us know what you spend on him, and you shall be given credit for it." But royal exhibitioners were not the holders of permanent endowments. The first of these seems to have been connected with St. Cross Hospital by Winchester, founded in 1130, where 100 poor men were daily entertained at dinner, among whom were thirteen of the scholars of the grammar school sent there by the master of the High Grammar School of the city of Winchester. The evidence that this arrangement was part of the original foundation depends on a suit witnessed in 1373. At Durham the Almoner's Register (f. 12) records a deed by which Simon of Farlington (which is in Hampshire, so that he knew St. Cross), Archdeacon of Durham, gave in 1180 the manor of Kyhon Durham, "for the maintenance of three scholars of Durham school, whom the master shall charitably choose, and sent with a tally with images of the Blessed Virgin and St. Cuthbert to the Almoner, who shall provide them with food and drink and lodging in the Almonry."

The two earliest exhibition foundations in France are connected with England. In 1180 an Englishman named Jocius, on his way home from a pilgrimage to Palestine, established at Paris an exhibition endowment at St Mary's Hospital at Paris of food and lodging in a separate chamber for eighteen poor "scholar clerks" with twelve *nummi* a month, while seven years later the Count of Dreux established a similar exhibition for poor clerks in the Hospital of St. Thomas the Martyr (Becket) at the Louvre. The term "exhibition" for such maintenance of poor scholars appears to be first used in England in the Merton College Statutes of 1274, which provided for the withdrawal of the maintenance of exhibition (*sustentatio* or *exhibitio*) of a turbulent scholar. Giffard, Archbishop of York, wrote on Mar. 7, 1276, to his bailiff to "maintain (*exhibe*) John Aucher and his two companions attending school at Beverley from Michaelmas at the rate of 2*s.* a week with their petty necessaries" (which the Merton College Grammar School accounts for the following year show to mean shoes, stockings, lights, and the like), "with 36*d.* for their gowns."

The wills of the fifteenth century are full of exhibitions. Thus in 1421 Thomas Greenwood of York and Lincoln gave 20 marks each to William and John Greenwood to learn their grammar. Ralph Snaith in 1472 directed that William Wakefield "be found at scole," and Sir John Pilkington in 1478 gave 6 marks a year to "find John Pilkington to his lerning at Oxenforth." In 1501 Robert Constable, sergeant-at-law, gave £20 to his son Marmaduke "for his fynding and exhibition in the University of Cambridge for 3 hole years byginning at 15 years old and £24 for 3 years more exhibition at an Inn of Chancery."

Perhaps the earliest use of the term in precisely the modern sense is to be found in Mulcaster's *Positions* in 1585, when he speaks of people who will "give a scholar some petie poore exhibition to seem to be religious." From this time exhibitions have been the favorite foundation with those desirous of becoming pious founders. While what was chiefly wanted was new schools and the increase of old ones, vanity was more cheaply flattered by the creation of exhibitions which were called after the donor's name. The creation of new secondary schools practically ceased from the Restoration in 1660 to the middle of the nineteenth century. But the flow of exhibition endowments went on intermittently. The Schools Inquiry Commission of 1867 warmly praised exhibitions as the means of bringing the lower-class boy to the top; and the few instances of farmers' or workingmen's sons who became bishops or headmasters or the like by means of exhibitions from the country grammar schools to the universities gave a new impetus to the foundation of exhibitions as building a ladder from the humblest station in life to the university. An enormous further impetus was given to this when, in 1896 and in 1902, large educational funds were put by the State in the hands of local authorities. While the real need of the country was new schools and the improvement of old ones by the provision of adequate pay for assistant masters, much of the funds was lavished on exhibitions to take boys from the elementary school onwards. About one in ten of the exhibitioners derives any real benefit. Too often the successful exhibitioner, prosperous as a scholar, merely adds to the crowd of underpaid and unsuccessful assistant teachers. Fortunately, the authorities are now directing more attention to the improvement of the schools and the provision for masters. A. F. L.

See Fellowships; Scholarships.

EXHIBITIONS, INTERNATIONAL, AND EDUCATION. — See Expositions, International, and Education.

EXHIBITIONS, SCHOOL. — An important, as well as most difficult, problem in schools, both private and public, is to secure the interest of the parents and the support of the community. One solution of the problem is frequently sought in school exhibitions. As not all the exercises of the school admit of a ready performance in public, or afford opportunity of interesting an audience, it is customary to rely upon a display of accomplishments — music, declamations, dramatic performances, calisthenics, or dancing; or upon the products of handwork, such as drawing, woodwork, or sewing. In schools where only literary subjects were taught, exhibitions were formerly limited to declamatory exercises. The evil tendencies of the practice are described as early as 1812 in the *Juvenile Mirror*, published in New York, which points out that as soon as a school exhibition is decided on all regular work is neglected, and everything is turned topsy-turvy "that the children may be taught the art of *spouting*." The pupils are not taught anything useful, but learn by rote pieces beyond their comprehension.

The use of the display of the attainments of pupils in order to enlarge the patronage of private schools was paralleled in the early stage of the public schools, when it was necessary to secure the public support. Public exhibitions, in the elementary schools of Boston and New York, were at times honored by the presence of the President of the United States, the governors of the states, the chief officials of the city, and other distinguished guests. In rural communities, the closing exercises of the schools constituted the chief event of the year, attracting the entire community within a radius of ten or fifteen miles to the open-air presentation of dialogues and plays. Great interest was aroused in new plans for the education of the neglected classes. Hence the schools of Pestalozzi, Fellenberg, Lancaster, Bell, Owen, and Wilderspin were visited "with wonder-waiting eyes" by princes and peers, clergy, and all types of educational reformers. Special occasions for demonstrating the merits of the new schools were found in stated examinations and exhibitions.

With the systematic grading of the schools, examinations ceased to have a public character, and the principal school exhibitions were the graduating exercises. Secondary and elementary schools imitated the college commencement in the conferring of diplomas, the salutatory and the valedictory addresses by graduates, and in many other time-honored features of the college. The ostentatious display of borrowed accomplishments, of dress, of flowers, and gifts, with the consequent burden of expense upon the parents, led to a reaction in favor of simplicity. Rivalry in dress is now discouraged, and a practical address to the graduates has generally replaced the immature productions of the pupils.

The modern curriculum has given occasion for many special forms of school exhibition, which present an exposition of the work throughout a school, or afford opportunity for the comparison of the schools of a city or of different communities. Local exhibitions are commonly made for from one to three days, usually at the close of the school year, and the work of each grade or department is properly arranged, labeled, and exhibited for the inspection of those visiting the school or schools. Sometimes, in larger cities, a collected exhibit is made at some central place at the close of the school year, or on account of some special meeting or occasion during the school year. Such exhibitions frequently last a week or more, and usually attract much local attention. This form of school exhibition is frequently provided in English cities, London having provided many such. For comparative study, specimens of drawing, maps, notebooks, charts, and all the various forms of handwork offer a distinct advantage. The first organized employment of such exhibitions was initiated by the lyceum movement, before the middle of the past century, and furthered by the New York State Education Department. Such were the expectations of the results of a friendly rivalry between schools, that the most sanguine advocates of the exchange of specimens of pupils' work hoped by this means to allay the bitter sectional rivalry then existing, and to avert the war that was imminent.

To the earlier great international expositions (*q.v.*) is to be attributed the first object lessons as to the possibilities of art and manual training; and to the more recent, the objective demonstration of nearly all phases of educational institutions. Pedagogic museums (*q.v.*), as those of Zurich, Brussels, Paris, and Berlin, containing permanent exhibitions of school work, are becoming recognized as necessary in a progressive state and city system. There could be no greater evidence of the growth of an enlightened critical spirit in educational affairs than a comparison between a school exhibition in New York one hundred years ago and a budget exhibit of the present. Such an exhibit aims, by a complete and graphic presentation of cost, method, and results, to win the taxpayers to the support of the enlarged activities of the schools. The most recent, as well as the most suggestive, development of the idea of school exhibitions, is the Child Welfare Exhibit, in which school work is presented as only a phase in the culture of children. This aims to demonstrate the most approved nursery equipment, diet, toys, and games; the most effective use of parks, libraries, and museums; the best planned Sunday schools, charitable and reform institutions, and the most suggestive school occupations.

Few exhibitions can be entirely free from the criticism quoted at the beginning of this article. Legitimate school work may be sacrificed to purposes of display; false standards may be inculcated through the overestimation of those phases of school work which are readily capable of representation; a fair showing of unaided, unselected work is difficult to secure; the effect upon pupils may be to increase the conceit of the precocious and to discourage those of moderate talent — to arouse an excess of self-consciousness: on the other hand, much benefit may be derived from well regulated rivalry between pupils, classes, or subjects; and through comparison of results improvement may be secured.

To be of the highest value exhibitions should represent the regular work of the school, not that prepared for the purpose; work of entire classes should be shown, rather than the work of the more talented pupils; competition should appear between classes or schools rather than between individuals. While preparation for an exhibition should not be the primary aim of any school exercise, such preparation may be used as an aid to interest and efficiency. All school exhibitions should serve some definite standards of selection. They should be interpreted with respect to the limitations of the purpose and the method of selection, and with the reservation that the most important educational results elude concrete representation.

J. F. R.

See Expositions, International, and Education; Festivals, School; Museums, Educational; Parents and Schools; Parents' Meetings.

EXHIBITS. — See Expositions.

EXNER, FRANZ (1802–1853). — A prominent Austrian philosopher and educational organizer; was born in Vienna and studied, first law, then philosophy, at the universities of Vienna and Pavia. In 1827 he began to teach philosophy in the University of Vienna; in 1831 he became professor in the University of Prague; and in 1848 he was recalled to Vienna to help in the reorganization of the Austrian school system. Together with Bonitz (*q.v.*) he brought about a complete reform of the Austrian secondary schools. Through him and his numerous disciples the Herbartian philosophy was introduced in Austria.

F. M.

EXPENDITURES, SCHOOL. — See Budget, School; Cost of Education; Records and Reports.

EXPENSES, SCHOOL. — See Budget, School; Cost of Education; Records and Reports.

EXPERIENCE AND THE EMPIRICAL. — In Greek theory experience as a source of knowledge and of skill was contrasted with reason. Experience meant the cumulative effect, intellectual and practical, of a repeated series of acts and sufferings of like nature, this cumulative effect covering what was handed down in tradition from previous generations as well as from previous acts of the same individual. Thus it is by "experience" that carpenters are able to build houses: previous acts of building have created in the community a conception of what sort of a thing a house should be; by the same past history various devices have been wrought out; and, finally, by apprenticeship and repeated practice, the individual carpenter has become skilled. In short, experience meant the training and practice which give skill and knowledge how to do in any branch of industry or art. The Greeks recognized an advantage and a disadvantage in this act of learning. The advantage resided in superior ability to deal with particular cases; and practical life, as distinct from science, focuses ultimately wholly in particular cases. The physician cannot cure individual cases of disease simply by his general medical science; the general who is versed merely in the theory of tactics and strategy is not likely to win battles. In all such cases, practice, or experience of a number of like cases leaving a sort of cumulative deposit of instinctive sense and skill, is absolutely indispensable. On the other hand, experience is so linked to habit and routine that, by itself, it is a slow and costly method of acquiring knowledge; and, moreover, is incapable of arriving at true principles or universals. The physician may learn from experience that certain symptoms indicate diseases that are best treated by certain remedial measures; but he must learn from reason how and why such and such remedies effect cures in such and such cases. Rational knowledge, therefore, is alone worthy of the name true knowledge. Science, in short, deals with explanation, with principles, laws, universals. Since habit and practice do not attain to this stage, science requires something transcending experience, *viz.* reason, *nous.* The geometer is not dependent upon repetition of practical contact with a great diversity of cases; in the degree in which he is truly a mathematician, a knowledge of a triangle may be secured at one stroke of demonstration. Moreover, rational knowledge is final, while empirical at the best is approximate, not necessary, and hence, in every case, true only "upon the whole," or usually. Thus the term "experience" was fixed as an antithetical term to "reason"; it had all the connotations involved in the word "empirical," as when we speak of a physician as a mere empiric.

Roger Bacon was probably the first to break away from this tradition. Medieval science was in such a plight from devotion to traditions which were supposed to embody reason that it was inevitable that some discerning person should perceive that the only hope of progress was in recourse to observation; and Roger Bacon was in advance of his time in his recognition of the possibilities of a control of experience through experiment. Francis Bacon followed Roger Bacon in somewhat vague use of experience as the ultimate source and arbiter of all the sciences. By the time of the later Renaissance the tide was all running in favor of experience; and a curious reversal of perspective took place. To the Renaissance, it was not experience which was associated with the past, with routine, with unanalyzed tradition, but rather authoritative dogmas which claimed to be founded on reason or to be intuitive and axiomatic, and hence not subject to inquiry or criticism. Experience, on the contrary, represented the incursion of the new, the fresh, the conquest of the unknown. With the invention and application of various devices like the lens, experience comes to mean observation of nature operating under the conditions most favorable to discovery.

The development of the mathematical sciences brought about, however, a reaction in favor of conceptual or rationalistic knowledge. On the Continent, the old dualism was reinstated in the form of the distinction between "matters of fact" and "truths of reason." This reaction toward a derogatory conception of experience was strengthened by the fact that Hume had shown that the emphasis put by Locke and his school upon sensation as the central element in observation, or experience, destroyed the validity of all knowledge involving relationship, and hence of all inference. In order to save science, mathematical and physical, Kant was thus led to introduce a new conception of experience; namely, that of a synthesis of a passively given manifold of sense by means of *a priori* active functions of thought. Only on the basis of this *a priori* function could, according to Kant, the universal and necessary character of scientific propositions be justified, and at the same time their applicability to the changing events of sense perception be explained. The inherent difficulty of the Kantian philosophy — that of showing how two absolutely antithetical elements coming from two opposite sources, one from the thing-in-itself, the other from thought — led his successors to move in the direction of the concept of an "absolute experience," an experience so comprehensive and permanent as to cancel the Kantian dualism.

Meanwhile other developments, partly within philosophy and partly within the biological and social sciences, were making for a radically different conception of experience. The interest from the Renaissance period on in the progress of science had led to the definition of experience in cognitive and intellectual terms. The new view of experience (see PRAGMATISM) reverts, as it were, to the Greek conception of experience as essentially a practical matter, *i.e.* a matter of repeated exercise and of its effects; while it reinterprets practice or action (1) in the light that scientific experimental methods have thrown upon the possibility of a control of experience; and (2) in the light that biology has thrown upon the life process.

The main features of the resulting concept of experience may be associated with the two chief connotations of the popular, nontechnical use of the term: namely, (*a*) to try a thing out, to test in action, and (*b*) to undergo, to endure, to suffer. With the first, or more active sense, experiment and the deliberate control of experience are connected; with the second, or more passive sense, the dependence of the individual upon contact with a world, social and natural, beyond himself. More specifically experience involves, first, an active experimenting with things. Every organism by its nature tries its active powers upon the world around it; it is the very nature of a living being to exercise its organs, and this exercise takes effect in and upon the surrounding medium. In lower organisms, this trying out of the agent in the world of things is blind and instinctive; in higher organisms, in man as he progresses in civilization, it is deliberate and purposive; it involves a forecast of consequences that may follow and the endeavor to manipulate the means requisite to produce these consequences. But in both cases there is some outreaching effort to modify the environment in the interests of life. (See ADAPTATION; CONTROL; ENVIRONMENT AND ORGANISM.) Experience, negatively put, is not mere passive reception; it is not mere acceptance of impressions externally forced upon the living being.

In the second place, this active experimenting with the world results in a changed attitude of the self. The organism has, so to speak, to stand the consequences of its acts. Its actions in modifying things about it modify the conditions which affect its own existence;

these changes may be not only unforeseen, but also out of harmony with the direction of its actions. Nevertheless the agent has to suffer or undergo these results. He "learns by experience" what he can do, as well as what it is undesirable to try to do, since through habit the results become embodied in his own structure.

Experience thus has a conservative, cumulative character, — the phase of habit, of formation of the self and all its powers by what it goes through. And since subsequent experience depends in large measure upon the set and bent given the self, upon its past activities, this involves also a certain preformation, a limiting, of further experience. But experience has also a prospective, outreaching, projective aspect. The principle of habit does not exhaust experience; it marks only a limit of movement in one direction. Curiosity, variation, invention, discovery, are involved in the active, or "trying on" phase, of experience, just as much as fixation in habitual attitude is in its "undergoing" phase. Which of the two phases, the conservative or progressive, is dominant at a given period of history is a matter not so much of the biological or psychological structure of experience, as of its social standards and aims.

From this point of view, it is possible to effect a reconciliation of the long opposition of the empirical, the *a posteriori*, and the rational and *a priori*. The opposition is not between experience and something transcending experience, but between the functions of habit and purpose in experience, in which the latter suggests new and varying ends, while the former provides the body of means for their effective realization; while consciousness (*q.v.*) marks the focus and stress of the readjustment of old habits to the novel aims. On this account, thought is as truly a factor of experience as is routine; reflection as legitimate and necessary a product as sensation. For thought is the projective tendency of life to vary the environment brought to conscious recognition, so that henceforth it occurs deliberately, not blindly. It is *a priori*, not in the sense of transcending experience, but in the sense of transcending the habits formed in past experience; in being prospective, or reinterpreting the past in the light of a possible future.

This abstract formulation finds a concrete exemplification in educational practice more readily, perhaps, than anywhere else. In various forms, the classic dualism of experience and reason was embodied in educational practice; a fact which was unavoidable, because the philosophic distinction itself grew out of the lack of interaction between custom and reflection, between traditional institutions and scientific discoveries, characteristic of ancient and medieval society. The mechanical arts (see Arts) were to be learned by experience, by practice; the liberal arts appealed to the higher faculties, and while practice and habituation could not be dispensed with, they were to be used as mere preliminary scaffolding. The bookish (the so-called academic and scholastic) character of education, the absence of concrete materials and appliances, was a natural correlate of the depreciation of experience. With the effort of modern philosophy to rehabilitate the concept of experience came the criticisms of the reformers against this type of education as not genuinely intellectual, but only verbal; and their emphasis upon observation, natural objects, and physical apparatus as indispensable factors of education. The mottoes "from the concrete to the abstract," "induction before deduction," "teach things, not words," "learn to do by doing," are all of them products of the exaltation of the function of experience.

Educational practice inevitably shared, however, in the one-sided notion of experience entertained by empirical philosophy; its neglect of the active and emotional phases of experience in behalf of its purely cognitive aspects, and the reduction of the latter to mere observation with inference excluded. On this account, the efforts of the reformers, as soon as their own personal inspiration was lost, tended to an external and narrow type of education, neglecting the culture of the emotions and imagination and the necessary correlation of inference and reflection with observation, in order that the latter might have educative value.

Since the latter part of the eighteenth century, educational practice, like philosophical theory, has been struggling toward a more catholic and fruitful conception of experience and its uses. It has been endeavoring to overcome the dualism between sense perception that neglects or even excludes thought, and thought that is purely abstract because remote from the concrete materials of observation and action. (See Course of Study; Education.) The hope of educational progress lies in the creation of an environment (*q.v.*) which, while adapted to the pupils' capacities, habits, and purposes, shall provide problems that will evoke and direct thought, or the conceptual function, and that shall organize imagery into a broad and fruitful view of nature and society. Thought, which is generated by the concrete predicaments or difficulties of experience, must be so developed and directed that it will afford a method of clarifying the obscurities of prior experience, of more flexible projection of new ends, and of more efficient control of the means of their realization. The teacher, in short, has to realize that "experience" means primarily action and the accompanying emotional appreciations; and that while these develop in one direction into habits and sense perceptions, they develop, in the other, into conceptions and intellectual systems. The proper contrast is not between experience and something else higher and better than experience, but between a crude, narrow, and mechanical experience, and an intelligent, enriched, and free, or growing, experience. J. D.

See EMPIRICISM; PRAGMATISM.

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EXPERIMENT. — A method of aggressive scientific analysis, to be distinguished from observation (*q.v.*). In observation the scientist waits for nature to produce a phenomenon, and takes as careful note as possible of all the details presented. Thus, the astronomer observes an eclipse of the sun. In experiment the scientist does not wait for nature, but himself produces certain phenomena at such time and place, and under such conditions, as will facilitate the analysis of the process under examination. Thus, if the physicist wishes to study the effect of heat upon metals, he does not wait for nature to change the temperature; he selects a specimen of the metal and varies its temperature at will. The advantage of experiment is that it permits repeated observation under favorable conditions. Furthermore, since the variations introduced are under control, the phenomenon may be studied deliberately from many sides. Thus the effect of temperature on metals may be studied at one time, and the effect of electric currents at another. Natural phenomena are usually very complex, and need to be analyzed. Experimental analysis is a much more aggressive type of analysis than any which can be carried out merely by observing natural facts.

From its very nature, experiment must be recognized as a late form of scientific method. When man first began to study nature, he was content to observe the facts. As soon as he understood some of the laws of nature, he began to modify natural processes for practical purposes. Little by little, he saw that his own modifications of nature furnished favorable opportunities for extending his acquaintance with natural phenomena. Practical experimentation thus preceded scientific experimentation. It was in the physical world that man first performed experiments, for it was in this sphere that man first controlled conditions enough to make experimentation possible.

Long after the physical sciences had come to recognize the value of experimentation, the biological sciences continued to be purely observational. Indeed, so powerful was the prejudice against any interference with nature in the physiological world that the science of physiology was slow in realizing even the possibilities of observation. In the last two decades, however, more than ever before, there has grown up in physiology a vast body of experimental material. The effects of feeding man and animals in various ways has been very fully studied. The effect of light and moisture on the life of plants has been worked out in great detail.

Psychology and the social sciences were even later in development than were the biological sciences. Like other branches of science, the psychological and social sciences began with mere observation. At first, no one thought of experimenting with mental processes and with social organization. To-day, on the other hand, experiments are freely performed. (See PSYCHOLOGY, EXPERIMENTAL.) The development of experimental methods in the study of human life led very soon to the demand for a study of educational problems by the same method. This demand has resulted in a body of methods and results known as experimental pedagogy (*q.v.*). There has been much unsystematic experimentation in the schools. Teachers have often attempted to improve their methods of work, and in so far as they changed some well-defined factor of the situation, they performed a strict experiment. Such a change may very properly be compared to the practical experiments of the earliest physicists. Practical experiments prepare the way for systematic scientific investigation. (See EXPERIMENTAL PEDAGOGY for further discussion of this matter.)

There are certain phases of natural phenomena which are very difficult to control and which can never be subjected to experimental adjustment. Thus, gravity always enters into every physical experiment; the social environment outside of the school always enters into every experiment in education. The only recourse left to the scientist in these cases is (*a*) to keep the uncontrolled factor, as nearly as possible, constant throughout the whole experiment, or (*b*) to study enough cases so that the results may be checked up in spite of fluctuations in the variable field. Thus, if we wish to study the effect of a certain method of teaching, and are aware that the external social environment will interfere with our experiment, we choose a large number of cases, in some of which the social environment will be favorable, in some of which it will be unfavorable, and by comparing the results of our experiments in all the different cases, draw conclusions which have a validity that transcends the fluctuation of social environment.

Experimentation thus passes insensibly into statistical inquiry (*q.v.*). In the latter, the phenomenon is recognized as so complicated by uncontrollable factors that safe conclusions can be drawn only after an exhaustive study of many different cases. The emphasis is commonly laid, therefore, in the study of statistics, upon the method of calculating the mass of material. The essential value of statistical study is, however, not in the calculation of the material, but rather in the analysis which can be worked out in spite of the complexity and heterogeneous character of the material. Thus, an investigation may be undertaken of the methods of teaching spelling. Shall lists of words be given which contain many like-sounding words, or shall the words be as diverse as possible ? The enormously complex processes which enter into any individual's effort to learn words are likely to discourage the experimenter who is familiar with the relatively much more controllable situations presented in the physical sciences. The student who is equipped with a combination of statistical and experimental methods is not so embarrassed. He faces the complexities of the case, and gives them all many opportunities to operate. He tries one kind of list of words, and then the other. He repeats the effort on dull days and bright, when the social distractions are many and when they are few. He gets enough cases ultimately so that he is justified in feeling assured that only the one factor which he is investigating has been uniformly present or absent. The other factors have fluctuated so irregularly as to neutralize their influence. Such an investigation is truly experimental, although it has been supplemented by the use of statistics.

C. H. J.

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EXPERIMENT IN EDUCATION. — The function of experimentation (*q.v.*) in education falls within two more or less distinct and more or less overlapping rubrics : (1) that conducted for practical, and (2) that conducted for scientific purposes. Schools are constantly reshaping their usual materials, methods, and devices of administration and discipline, as well as of instruction. Nothing could be farther from the truth than to suppose that schools are static, immobile, hard to influence in the direction of change. On the contrary, school authorities, from their controlling boards through their supervisory force to the individual teacher, are very sensitive and responsive in many particulars to suggestions of change. The course of study; the methods of teaching reading, writing, spelling, arithmetic; the ways of dealing with uninterested and refractory children; the type of schoolbook and its mode of presentation; and countless other matters of this kind are undergoing constant experimentation. This rubric includes, then, all such changes as are tried not for the sake of experimentation, but for the sake of getting concretely better results in some specific points. None the less, there is hereby supplied an immense body of possible experimental data for controlling the formation and testing of educational theories. What is needed in order to make this specific and casual type of experimentation more available for the science of education is (1) more careful and exact observation of the conditions and effects of such changes ; and (2) systematic arrangement for the registration and communication of the results obtained. In other words, a large part of this practical experimentation is now scientifically useless because (1) no pains are taken to record the antecedent state of affairs into which the change is introduced, and to isolate the special consequences which follow from its introduction; and because (2) the results are not recorded and published in such systematic form as to secure cumulative and coöperative results. As a consequence, the same, or very similar, devices and suggested improvements are tried here and there, or, after a lapse of years, even in the same school system over again, without anything being positively learned, or learned in such a way as to secure its own persistence, if desirable, or its own future nonrecurrence, if undesirable. If one compares the pains taken to secure, record, and make publicly available every item of astronomical experience with the scanty and almost accidental methods of keeping track of and utilizing the varied results of educational experimentation, one readily sees the chief source of the backwardness of educational science.

Educational experimentation in the narrower sense refers to changes made not so much for the sake of improving specific and detailed results as for the sake of throwing light on some educational problem. (This type is discussed more fully under EXPERIMENTAL PEDAGOGY.) These two types of experimentation, however, inevitably blend or shade into each other. If the public realized how much practical experimentation is going on, and how much of it is crude and random, it would doubtless take more kindly than it does at present to experimentation initiated by experts, having for its objective a definitive contribution to some special problem. Scientific experimentation must itself be subdivided into two kinds, according as it is more specific or more general: (1) A body of data regarding the observations, the memories, the habit-forming, etc., of school children is already accumulating, through suitable adaptations of the methods of the psychological laboratory. By experimentation of this sort much light is being shed upon the relative efficiencies of existing methods of teaching reading, writing, spelling, etc., and concerning the value of this and that specific method of forming a particular schoolroom habit. The comparative definiteness and accuracy of such results is often apt to blind those undertaking the experiments to the limitations of their educational value. They are valuable so far as they aid in the evaluation of existing methods used under existing conditions. They are of comparatively little value in criticizing the existing conditions, or in answering the question whether they ought to be continued in existence. There are certain questions of underlying motivation, purpose, and spirit in education which cannot possibly be worked out under laboratory conditions, until they have first been introduced under school conditions; and these problems are educationally the more fundamental ones. In short, laboratory experimentation, or adaptations of the technique of the psychological laboratory, will show what methods in current use are most effective under conventional conditions ; they will not test the relative worth of the conventionally current type of education as compared with some suggestive reformed type. (2) For the latter purpose, special experimental schools (*q.v.*) are absolutely indispensable. Their results are less quantitative, seemingly less accurate, and less scientific, just because they are dealing with matters educationally much more important. However, this does not mean that the two types of experimentation are opposed to each other, but that they should supplement each other. J. D.

EXPERIMENT STATIONS, AGRICULTURAL. — See AGRICULTURAL EDUCATION.

EXPERIMENT, TEACHING BY. — Teaching through a series of experiments is characteristic of the modern teaching of the natural sciences. Such work is sometimes performed as a demonstration by the teacher, and, more frequently in the higher grades and schools, as an individual experiment by the students. The development of teaching through experiments is part of the general movement for learning through direct observation. Object lessons, observation work, school excursions, and laboratory experiments or demonstrations are different methods of inductive teaching; the highly controlled nature of experimental demonstrations being the differentiating factor. Sometimes the method of instruction by experiment is called the method of "discovery," or "rediscovery." Such a use of terms is loose, inasmuch as there is little or no inventiveness on the part of the student in the devising of apparatus or the arranging of conditions. These are all prearranged by the instructor so as to make a conclusion fairly obvious. Teaching through experimentation is a highly rational representation of scientific facts rather than a rediscovery. It should be used with a definite knowledge of its limitations. H. S.

See articles on the various Sciences; INDUCTIVE METHOD; LABORATORY METHOD; DEMONSTRATION; OBJECTIVE METHOD.

EXPERIMENTAL PEDAGOGY or EXPERIMENTAL EDUCATION (also scientific or empirical pedagogy).— The terms coming into general use to designate the second type of experiment in education described above under that title. Current discussion has not settled whether the term shall be limited in its application to the first of the two kinds of scientific experimentation described above; namely, that conducted under laboratory conditions; or whether it shall also include the more general observational work, such as was conducted by Herbart and his followers throughout the last century. The more recently developed school of investigators, using methods borrowed for the most part from experimental psychology, are claiming the exclusive right to the term. The present article presents this phase of the subject. The more general aspect will be presented under the titles RESEARCH IN EDUCATION, and EXPERIMENTAL SCHOOLS.

Experimental pedagogy has received its name because of its emphasis on experimental methods, though it embraces all pedagogical facts obtained by scientific investigation, regardless of the methods used. The movement to establish a pedagogy of this sort is comparatively recent and has plainly grown out of the scarcely older science of experimental psychology, whose methods it largely follows and whose results it extensively utilizes. Experimental pedagogy, therefore, implies an opposition to a pedagogy of a more theoretical character based upon some philosophical system or preconception of the aim of education, and upon the casual observations of educators. Those who support the movement for experimental pedagogy hold that the results of such methods of investigation must necessarily be partial and individualistic and lacking in certainty and concreteness.

Although experimental pedagogy follows the lead of psychology in both its methods and its results, it relies also upon results of all the sciences whose facts have significance for education, such as anatomy, physiology, anthropometry, pathology, logic, ethics, and æsthetics. It borrows facts from all these fields, but regards them from an entirely different point of view; namely, that of education. It is therefore an independent science. While experimental pedagogy is dependent for its facts to some extent upon all of the sciences mentioned, it is chiefly indebted to investigations of the physical and mental life of the child, such as are afforded by child psychology and physiology, and the pathology and psychopathology of the child. The child thus becomes the object of exact investigation, and pedagogical principles and methods are decided upon the basis of scientific observation of their effect upon his training and development.

Experimental methods always have certain advantages over haphazard observation. They introduce precision and definiteness, because the conditions under which the phenomena occur are controlled by the investigator. The investigator is, therefore, able to vary the conditions in such a way as to make an analysis of the truly causal elements. For the same reason the results of any investigator are open to confirmation by other investigators who can repeat the original conditions. One other advantage to be gained from experiment is that the phenomena to be observed may be made to appear by the investigator without the necessity of waiting for them. Besides experimental methods proper, experimental pedagogy makes extensive use of statistical methods of investigation, which also tend to free its results from the errors of faulty deductions based upon the purely qualitative observation of individual educators. The application of experimental methods to the investigation of pedagogical problems involves the same kind of procedure as in experimental psychology, and also involves the same difficulties. It has, however, the added difficulty that the subjects of the experiment are always children, who are less likely to be able to report their own experiences correctly, and whose experiences are more likely to be misinterpreted. This difficulty, however, is by no means insuperable, as may be seen from the large mass of information which this new science has supplied. Among the most important of the experimental results are those which have been obtained from investigations of the nature of the child's mental and physical development and its stages, investigations of the individual differences and mental capacities of children, investigations of fatigue and economic methods of learning, besides special investigations into the methods and results of teaching drawing, writing, arithmetic, reading, etc. E. H. C.

See Child Study; Experiment; Experimental Schools; Experiment in Education; Pedagogy; Psychology, Educational; Psychology, Experimental; Research in Education.

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EXPERIMENTAL PSYCHOLOGY. — See Psychology, Experimental.

EXPERIMENTAL SCHOOLS (also New Schools, Demonstration Schools. — The discovery of large and novel principles in teaching, such as seek their fulfillment in a complete process of child development, issue almost of necessity in the endeavor to found a school in which they may be realized, or at least tested by experiment. True, some of the earlier reformers, such as Locke and Herbart, watched the relation of theory to practice as private tutors to one or two children; but with Pestalozzi the idea became firmly established that reform must be both studied and demonstrated in an institution designed for the purpose. Hence many forms of restless inquiry after truth in matters of schooling have taken shape in New Schools or Experimental Schools, from inferior enterprises conducted by charlatans to those which have exercised a profound influence on progress. The efforts of Froebel can be regarded as typical: typical too in this sense that the work of the reformer, especially if it be copied in detail by disciples, tends to crystallize into a system and eventually to resist further change; particularly when, as in the case of the kindergarten, it secures recognition by the state authorities and is modified to suit the necessities of a public system. The Herbartian pedagogy is another striking example of the tendency: the very completeness of this *System der Pädagogik* has hampered its advocates in the face of new aspects of truth which have appeared since Stoy and Ziller formulated their doctrines. At the present day a perplexing variety of institutions can be discovered at work. In America the most important have been definitely associated with institutions for training teachers; and this is a wise arrangement, for the reformer cannot spread his new gospel unless he find adherents. In a list of such schools recently published are found not only the Horace Mann and the Speyer School, and the schools connected with the University of Chicago (which are reaping the harvest sown by Francis Parker and John Dewey), but schools at Hyannis, Kalamazoo, and Columbia, Mo. The list might be widely extended, for every training school is *ipso facto* " new " or "experimental" in so far as those who train teachers are expounding the newer truths of child nature and are exhibiting these in the expanding life of school children. It is on this ground that the present writer chose the title *Demonstration School* as exhibiting more clearly the common purpose that the reformer and the professor of education must have in view. The Fielden Demonstration School in Manchester, England, was expressly founded to supply the needs of a university department of education, and the extent to which its teaching is "new" or experimental will depend upon the quality of the theoretical pedagogy taught in the university from time to time. The title has now been adopted by the English Board of Education, and there are now a number of public elementary schools to which this name has been attached in order to signify that the school has some sort of connection with a training college. But there is no guarantee that the schools to which this title is allotted are actually demonstrating the ideas of lecturers who expound curriculum and method ; they are in fact nothing more than practice schools under a new name, *i.e.* schools under the ordinary régime in which students are specially invited for observation and practice. Nevertheless a step has been gained in recognizing the need for associating theory with practice, and these selected schools will no doubt tend as time goes on to be set more and more apart for the distinctive task which the title implies.

In Europe the great majority of schools which aim specifically at reform had no connection with training ; besides the one at Manchester, the only school generally known is the famous *Übungsschule*, directed by Rein since 1885, at Jena. The group of schools which are now exercising the greatest influence trace their origin to the New School at Abbotsholme, England (*q.v.*), founded by Dr. Cecil Reddie and others in 1889, a boarding school receiving boys at high fees, and educating them largely in the open air, with a vigorous corporate life. Bedales School (*q.v.*) in Surrey is of the same character, and receives both boys and girls. Dr. Lietz, formerly a student under Rein at Jena, was one of Reddie's chief disciples, and has founded three schools, called *Landerziehungsheime*. There are at least a dozen other boarding schools bearing this title in Germany, Austria, and Switzerland, which follow more or less nearly the ideas of Reddie and Lietz. Their success may be regarded as a reaction against the ultrabureaucratic and conservative tendencies in the state secondary systems, and they as the successors of reformed schools in the earlier half of the century. Institutions of a similar type both in France and in America are well known. They tend of course to become exclusive in status, because of their dependence on wealthy patrons.

In contrast to these, a number of New Schools are to be found which do not aim to receive children as boarders, and are concerned with primary rather than secondary education. Froebel's experiences may be treated as typical of a situation which recurs again and again. In his earlier years he established a boarding school at Keilhau, designed on lines which recall those of the *Landerziehungsheime*, but his way was blocked by state control, and Keilhau still flourishes as a boarding school, but makes no pretensions to reform. Froebel then turned his regard to the younger children, and it is with these that most of the present-day reformers are concerned. For both the psychologist and the teacher have a clearer ground for experiment and progress when they receive their scholars in earlier years, at a stage, too, when the state system is not so concerned to control the results by examination tests; and in an environment where the parents and the community can be associated in a social effort for the rising generation. The Ethical Culture School, New York, the King Alfred School, London, the Settlement School, Moscow, some half dozen schools in Holland, Dr. Gardelli's *Ecole Nouvelle* in Milan, Dr. Kerschensteiner's *Versuchs-Schule* at Munich may be cited as examples of enterprises which are always being set on foot. Such schools are usually hopeful of being able to carry forward their scholars through the secondary stage also, but they find parents unwilling to forfeit the material benefits gained by sending their children to the approved public institutions for the completion of secondary schooling.

A few words may suffice to indicate the trend of the reforms which such schools seek to achieve. To the superficial parent new subjects of study are the chief attraction: arts and craft, nature study, manual exercises, hygiene, have a prominent place; the formal drill of the large school is replaced by spontaneous activity. But the reformers themselves usually take wider views, some of which are the outcome of scientific research in biology and psychology, or, still more recently, in sociology; definite questions are proposed, and the school makes an experimental endeavor to answer them. Of this type Dewey's work in Chicago is an illustrious example. But most of these endeavors spring from impulses not so clearly formulated, but more readily welcomed by parents who share them — impulses for the regeneration of society in the large sense. These reformers are social reformers to begin with, and are teachers because they are thrown back on the school as the readiest means for the achievement of their ideals. Dr. Reddie's school began, for example, in association with Edward Carpenter and other ultra-socialists, although it soon severed itself from that alliance. Hence not only do we find all the novel subjects, such as manual training, playing a part, but the corporate life of the school, its relation to parents, the relation of the sexes, the attitude of the teacher and child toward religion, — these are all matters in which the reformers break away from tradition.

J. J. F.

See Abbotsholme; Bedales; Deutsche Landerziehungsheime; École des Roches; Teachers, Training of.

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EXPERIMENTAL SCIENCE IN EDUCATION.— See Experimentation; Scientific Method; and the special subjects Botany, Chemistry, etc.

EXPERIMENTATION, LOGIC OF. — In the control of discovery and proof, that is to say, of the logical processes concerned in the formation of ideas and beliefs, experiment performs a double rôle. On the one hand, it is employed to vary the facts that are open to observation, and thereby to facilitate the formation of new views, new theories and hypotheses simply as suggestions, ideas which may or may not be valuable and valid. Habit and custom tend rapidly to fixate beliefs and thereby to bring about an arrest of intellectual life. So far as things present themselves in regular and uniform ways to which we have become "used" or accustomed, we make habitual reactions, and thought, or reflective attention, is not required.

Experiment operates to change the customary state of things, and thereby to present challenges to thought, seeming discrepancies, unexpected phenomena, that require explanation (*q.v.*). Experiment does this in three ways. (1) It intensifies conditions which are usually too minute to be noticed, and which therefore are not taken into account in inference. (2) It isolates conditions which are usually so absorbed or covered up by other relations as to escape attention. It rearranges them so as to form a different perspective, thus giving a shock to vision. (3) It combines things that rarely come into conjunction with one another, or that combine under conditions of violence unfavorable to observation, in steady and recurrent ways, so that the observer can see what is going on. Taken in this sense, experimentation includes the use of all devices (microscopes, telescopes, staining fluids, registering apparatus, etc.) which are intentionally employed to increase the range, the detail, and the accuracy of ordinary observations, thereby extending and safeguarding the use of observation as stimulus and food to thought.

After an idea or hypothesis has been formed and elaborated on the basis of the new data provided by experimental observation, the idea must be tested or verified. This means that the idea must be employed as a plan and method of conducting new observations under test conditions. That is to say, the conditions or causes called for by the hypothesis must be brought into existence with a view to seeing if the effects or consequences, theoretically deduced, follow in accord with the requirement of the hypothesis. To substantiate the theory by reference to the conditions which originally suggested it would be to reason in a circle; to substantiate it through new and independent observations is good as far as it goes, but defective except as these new observations have been framed so as to correspond to the terms of the theoretical explanation and thereby adapted to the purpose of testing.

So far as the stimulation and guidance of reflective thought are concerned, school conditions leave much to be desired. They are much better adapted to the acquisition of a body of fixed information than to investigating operations of inference, discovery, and proving. The absence of opportunity both for initial experimentation to supply stimulating challenges to thought, and for concluding experimentation to test the worth of the ideas reflects the intellectual conditions which anteceded the gigantic forward movement in science following the general adoption of the experimental method. Even when laboratories, etc., are introduced, they are often used simply as devices for acquiring an additional store of information or for learning a special technique of manipulation, rather than as an organic factor of the process of awakening and fruitfully directing thought. On the other hand, technical equipment and apparatus are not required to any great extent in employing the logical method of experimentation in many school subjects. By questioning, by simple constructive devices, children may be led to take account of data which they have got used to ignoring, to entertain, consequently, new problems (*q.v.*), and to frame hypothetical modes of solution and explanation. They can then be held responsible for the definiteness and fullness of the idea, and also for suggesting ways in which the idea may be tested, and for going as far as conditions actually permit. Such methods of instruction, intelligently employed, will go farther in forming a genuinly scientific attitude of mind than will an elaborate equipment of technical apparatus employed without regard to its rôle in the provocation and guidance of reflection. Moreover, it will create a natural demand for such additional equipment as may be genuinely needed, and will ensure its proper educational use when secured.

J. D.

See Scientific Method; also Laboratory, and the articles on the special sciences, as Chemistry, Physics, etc.

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EXPERT, EDUCATIONAL. — A person who by virtue of his special scientific and professional training and his practical experience is so thoroughly informed and skilled in matters of educational method that he is competent to testify on matters of opinion presumably not within the knowledge of men in general, or even within the information of teachers in general. The actual special use of such persons apart from the regular supervisory staff of officials is recent. It is an increasing practice of late for private schools, and even public school systems, to employ a school official from outside to examine the school organization and instruction. The usual method is to observe and examine the school for a week or more, making comparative and standard tests of efficiency, the whole inquiry ending in constructive suggestions. The use of a group of experts on special boards of inquiry into the competency of school systems is just beginning in our larger cities. Occasionally a school system has maintained an advisory educational expert (usually one of the educational faculty of a neighboring university or normal school) upon part time, for the purpose of counseling the board of education and the supervisory staff during a transitional period, as in the formulation of new courses of study, or the introduction of vocational schools, etc. H. S.

See Teaching, Profession of; Centralization ; City School Administration.

EXPLANATION. — The function of explanation presumes the existence of some fact or event which is apparently an exception or anomaly. Only that needs explanation which awakens curiosity or surprise. "Explanations" that do not start from what is felt to be a difficulty (or to offer opposition to the usual way of looking at things) are only verbal. Perhaps no mistake is more frequent in teaching than to proffer explanations of matters before pupils have been brought to recognize any problem that needs attention; or than to require from pupils explanations of what to them is obvious, because of familiarity, or else inexplicable, because wholly strange.

Psychologically, explanation always consists in assimilating the strange to the customary, the unexpected to the habitual, the novel to the familiar. One always feels at home in what is familiar; no matter how many difficulties may attend the subject matter in the abstract, mere familiarity glosses over or covers up all such difficulties in the concrete. The familiar feels plain, clear, easy, natural, matter of course. Hence to reduce any exceptional or disturbing fact to the rank of the familiar is to make it plain — to explain it, or clear up its mystery.

The practical educational problem relating to explanation has, therefore, to do with the proper adjustment to each other of the familiar and the novel. It consists, on the one hand, in presenting the usual, the customary, in such a way that pupils realize that there are strange things, things needing investigation and explanation, in what had seemed to be a matter of course. Genius itself has been defined as the power to detect cause for wonder in the ordinary. On the other hand, the educational problem has to modulate, as it were, from the extraordinary and mysterious thing over to what is already so mastered as to be familiar. In effect, explanation operates by inserting a number of intervening steps or terms, which, taken one by one, span the gulf between the familiar and the strange.

Logically, theories about explanation have been of two kinds. According to one view, explanation is bringing a particular under a general or universal, or a fact under a rule or law, the law under a general law, etc., — what is technically known as "subsumption." The objection to this view is that it is committed to certain "ultimate principles," which, being the source of all explanation, are themselves wholly inexplicable, or mysterious, so that they have to be accepted dogmatically or taken on faith. It also overlooks the fact that a great deal of explanation does not consist in bringing a particular fact under a general principle of law, but in assimilating a strange or peculiar fact to a fact with which we are already acquainted, by means of some general principle. These objections, worked out, lead to the view that the logical essence of explanation is placing in a system, that is, in a group of interconnected facts. Facts and principles reciprocally explain, or clear one another up, on this view, because they are both involved in systematized knowledge. J. D.

EXPOSITION, RHETORICAL. — See Composition.

EXPOSITIONS, INTERNATIONAL, AND EDUCATION. — The popular mind usually thinks of expositions as a development of the latter half of the nineteenth century. This is correct only in the officially international character which expositions then assumed, beginning with the London Exposition held at Crystal Palace in 1851. As a matter of fact, expositions antedate the Christian era, and were usually connected with certain recurring religious festivals. Roman festivals of this nature were always accompanied with the exhibition and sale of merchandise, and the performance of plays and games. In fact, the three main divisions of an exposition to-day

— the exhibits, the amusements, and the educational congresses — have their respective counterparts in all of the ancient fairs of Europe and Asia. The market fairs of the Middle Ages were a continuation of the same idea, and were usually held under the warrant of the lords spiritual or lords temporal, to whom a large royalty was paid for their protection and support. Some of these fairs became famous for their extent and patronage, such as Beaucaire and St. Denis in France, Leipzig in Germany, Southwark in England, Hurdwar in India, and Nijni-Novgorod in Russia.

The development of the modern exposition has generally been attributed to the genius of Napoleon, who encouraged their frequent holding in Paris for the sale of French industrial and art manufactures. No nation has held so many fairs of national and international scope as France. The first international exhibition proper was held in London in 1851, and is so denominated because of the official invitation from the government to all civilized countries to participate, and because of the exhibits covering every phase of human endeavor. Eight others have been held since that time, — four in Paris, in 1867, 1878, 1889, and 1900; one in Vienna in 1873; and three in the United States: Philadelphia, 1876; Chicago, 1893; and St. Louis, 1904. Two others are in contemplation, one at San Francisco in 1915 to celebrate the completion of the Panama Canal, and the other in Japan in 1917.

Every exposition, perforce, has been educational, as the interchange of ideas and methods has been no less general and influential than the interchange of commodities. This idea reached its culmination at St. Louis in 1904, where the appeal to Congress for funds, to the states for support, and to foreign nations for coöperation was made upon this basis. Education in its broadest sense was meant, — the education which comes to people in observing art and architecture in heroic models; in studying exhibits grouped in relation to their interdependence upon each other; and in watching processes in connection with these exhibits which take the raw product and under the eyes of the beholder transform it into the finished product. At such an exposition, it can easily be inferred that the science of education, its methods and results, would receive the most careful attention.

It is not within the scope of this paper to trace at length the effect which the successive exhibits have had upon the development of education methods in various countries. Here it is only proposed to give the facts concerning the participation of education in expositions and point out its remarkable growth in exposition activities. There is no record of educational exhibits playing any part in expositions prior to the Paris exposition of 1867. A few miscellaneous art pieces prepared by schools were shown from time to time, but more for their novelty and excellence of workmanship than as illustrative of any mental training. At the first international exposition in London in 1851, education was not recognized in the official classification, and had no department assigned to it. There were some exhibits installed under the head of "Civil Engineering," and others under the head of "Art," which could be termed educational, but they were accidental rather than premeditated.

It is interesting to trace the introduction and development of education in exposition classifications, as it is coincident with the recognition of education as a fundamental science and the basis of all other arts and sciences. The completely organized exposition of Paris in 1867 was the first to give education a definite assignment in the exposition. It was spoken of in the official report as "A judicious innovation introduced by the Imperial Commission." Group 10, under which the educational exhibits were installed, had the very peculiar designation of "articles exhibited with the special object of improving the physical and moral condition of the people." Many of the exhibits made under this heading would be classed under social economy at the present time, or under sanitary engineering. The exhibits made by the schools at this exposition were desultory and scattered, and show no signs of a logical or orderly arrangement. It is curious to note that the sole entry from the United States under this heading was "specimen of a Western primary school and school furniture," made by the state of Illinois. The Italian and French art schools made the only notable exhibit in the educational field at this exhibition.

At the Vienna exposition of 1873, the official classification, under Group 26, provided for "Education, Teaching, and Instruction." The first logical subdivision under this general head was also made at this exposition, and four classes were provided, for elementary instruction, middle instruction, professional and technical colleges, and universities. It is pleasing to note that the United States commissioner to the Vienna exposition made some effort to secure a very complete set of education reports, and some maps and statistics. Through his efforts thirty-three states and thirty-seven cities and towns contributed various material. The city of Boston made the largest and most complete exhibit in the United States section, and won many awards for its drawing and written work. There was a more general participation by nations in the educational department at this exposition than had occurred before. While the exhibits were grouped under the four general heads given above, they were incomplete and scattered in character.

The Centennial Exposition at Philadelphia in 1876 missed the opportunity of improving upon the Vienna classification, and a retrograde movement is noticeable. Education was recognized as Department Three, under the title of "Education and Science," and seems to have been a rather hopeless mixture of education and the liberal arts. In spite of this, however, the exhibits were more logical and of more general interest than in any exposition theretofore. They were installed in the gallery of the main building of the exposition, were extensive in character, and while there was no care taken for logical arrangement, there were many instructive lessons to be drawn from the material shown. The wonderful exhibit of drawing of the Boston schools, and its effect upon the schools of the country, is historic, and will be treated under another head. The foreign exhibits at this exposition were also noticeable, particularly the Swedish sloyd and the French and Italian art schools.

Education had now become a recognized factor in all international expositions, and in the Paris expositions of 1878 and 1889, Group One was assigned to art, and Group Two to education. At both of these expositions the application and processes of the liberal arts were included in the group, but a separate class was made for each of the three main divisions of education, namely, primary instruction, secondary instruction, and superior instruction. It lies hardly within the scope of this article to discuss the nature of the exhibits at these two expositions. Space in the galleries of the buildings surrounding the Champ de Mars was assigned for the installation of the material, and there was a very extensive participation on the part of both France and the foreign nations. As might be supposed, the exhibition of 1889 was the more complete and interesting, although the classification was exactly the same at both expositions. Historically, the exposition of 1878 was of greater interest, inasmuch as the dissatisfaction with the exhibit of the French schools, in addition to appeals from chambers of commerce and large manufactures on the decline of technical skill, brought about a serious consideration of the subject by the French government, and led to twenty years of agitation and statutory enactments, which culminated in the establishment of the well known schools of commerce and industry under the supervision of the French Ministry of Commerce. The participation of the United States in both of these exhibits was extensive so far as quantity of material was concerned, but no attempt was made to show thoroughly our system of education. An exhibit of freehand drawing from the schools of Boston was again the chief feature of the United States exhibit at these expositions. In fact, nine tenths of the entire educational exhibits at expositions were up to this time drawing and art work. The statistical chart first began to play an important part in 1889.

At the World's Columbian Exposition at Chicago in 1893, education was relegated to a minor position and made a group under Liberal Arts, medical apparatus preceding it, and printing and publishing following it. Judged as a classification, it was inferior to either of the preceding Paris expositions. In spite of this lack of official recognition, the installation was superior to that of any exhibit before made, and although the space assigned was in the gallery of the liberal arts building, it was ample. For the first time an attempt was made by the various states to show by a graded and continuous series of work the complete public school system. The foreign participation was not as general in this exposition as it should have been, but the German educational exhibit was particularly notable for its excellence, especially in higher education; the French exhibit was also thorough and interesting.

It remained for the French at the Paris exposition of 1900 to make the first proper official recognition of education in the classification, and to give a scientific development to the subject. For the first time, education was made Group One in the exhibit classification, for the reason, as stated by M. Alfred Picard, the Director-General, that education was recognized as the source of all progress and the basis of all human endeavor. Liberal arts was divorced from education for the first time, and six classes were established under the educational group: (1) primary education; (2) secondary education; (3) higher education; (4) art education; (5) agricultural education; (6) special industrial and commercial education. Unfortunately, the space assigned to the educational group in the galleries of the buildings on the west side of the Champs de Mars was inadequate, and many exhibits were installed in other parts of the grounds. The participation on the part of other nations was very complete, and the United States, Japan, Russia, England, and Hungary made particularly extensive and thorough exhibits. The German exhibit at this exposition was almost entirely confined to apparatus connected with the university and technical education. It is interesting to note that England for the first time made an exhibit in the educational section of an international exposition. The United States exhibit at the Paris exposition was distinctively national in its character. The best work and the most improved methods in each of the classes under the education group were displayed irrespective of source. The exhibit of the colleges and the universities was based on the same principle. The exhibit was arranged according to the departments of university instruction, and any college or university might contribute material to any one or more of the departments. The exhibit was very complete in illustrating by maps, charts, photographs, and written material the work of every grade and department, from the kindergarten to the University;

and while lack of space was perhaps the compelling motive for this arrangement, it turned out to be by far the best arrangement from the national standpoint. It prevented the duplication which would necessarily arise by recognizing state and city exhibits, and gave a concise logical view of the entire educational system. It demonstrated also the fact that, although there were at that time forty-five states, each with a supposedly separate educational system of its own, they were all, in fact, the same, with no more variation than local color or prejudice might afford. This is attributable to the influence of the United States Bureau of Education, which, under the lead of its Commissioner, Dr. William T. Harris, had for years served as a judicious and respected adviser to school superintendents throughout the country; and to the influence of the National Education Association (*q.v.*), which, through its annual meetings, had served as a clearing house for educational ideas, and brought into close and harmonious relations the educational leaders from every part of the country.

This exposition also brought out the radical difference between the schools of the United States and those of France and other nations under its sphere of influence. It emphasized the vital problems of educational life by placing side by side in contrast the many systems evolved from the various relations of the governing and the governed. The question most general in its application and most diversely represented at the exposition was to what extent the social and industrial development of a nation warrants specialized training at public expense in elementary schools.

It is interesting to note that funds were raised by the city of Manchester, England, with which the entire United States exhibit was transported to Manchester at the close of the exposition, and there remained open to the public from January to March, 1901.

At the St. Louis exposition of 1904, education received its highest recognition in exposition practice. The entire St. Louis classification was constructed by men who had been trained in the Chicago and Paris expositions, and was revised by experts in every branch of art and industry, and has since stood as a model for every exposition held. Education was made Group One of the classification on the principle enunciated for the Paris exposition of 1900, and was peculiarly appropriate, inasmuch as the idea underlying the entire St. Louis exposition was educational. In addition to the Paris exposition classification, two groups were added, namely: " Education of defectives," which had theretofore been included under charities, and " special forms of education," including summer schools, extension courses, etc. The classification read: " Department ' A ' — Group One, elementary education; Group Two, secondary education; Group Three, higher education; Group Four, special education in fine arts; Group Five, special education in agriculture; Group Six, special education in commerce and industry; Group Seven, education of defectives; Group Eight, special forms of education."

The crowning recognition given to education at this exposition was the assignment of a separate building covering five acres of ground in the very heart of the exposition for the use of the department. This marked an era in the development of education at expositions, and permitted a strictly classified arrangement of all material exhibited in accordance with the theory of the classification above mentioned. The participation was very thorough, nearly all of the states of the Union participating, and all of the leading colleges, universities, and technical schools. Following out the idea which underlay the exposition as a whole, an exhibit of processes was installed with success for the first time at an international exposition. The schools of St. Louis maintained daily classes in kindergarten, domestic science, and industrial training. Classes for the deaf and dumb were in actual operation throughout the exposition season, and a business school course was also successfully maintained. The agricultural and mechanical colleges of the United States, in their remarkable collective exhibit, carried on regular laboratory experiments throughout the season. Other illustrative work in music, art, and other subjects was given from time to time in special lecture halls or recitation rooms. Other activities of the school or college classroom were produced during the exposition period.

The foreign nations which made the most extensive exhibit at St. Louis were England, France, Germany, Italy, Sweden, Belgium, Japan, China, Mexico, Cuba, Brazil, Argentina. No extended mention can be made in this space of these exhibits, but they were all in accord with the theory of the exhibit. Perhaps the most noticeable was the wonderful technical exhibit of the German universities. The first exhibition of Chinese educational work ever made at an exposition was interesting in its comparison of the old education with the modern introduced by foreign auspices in seaport cities. Three things, for which the St. Louis exhibit stands preëminent, are its scientific classification, the provision of a separate building for education, and the success of the " working exhibits."

No mention is made in this sketch of the many education exhibits made at national expositions, such as Nashville, Omaha, Charleston, Buffalo, Portland, and Seattle in this country, and Brussels, Antwerp, London, and other places abroad, inasmuch as they were simply replicas on a much reduced scale of exhibits made in international expositions.

H. J. R.

See Exhibitions, School.

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EXPRESSION. — See Emotional Expression.

EXPRESSIVE SUBJECTS. — Those subjects which call for a large amount of self-expression or action (*e.g.* manual training, music, drawing, etc.). They are distinguished from the formal (*e.g.* reading, writing, arithmetic, etc.) and content subjects (*e.g.* history, geography, literature, etc.). The expressive subjects represent the latest acquisitions to the course of study. In the broadest sense the expressive activities of the school include not only the active subjects mentioned, but also the play and social activities of school life and the expressive aspects of the older subjects, more particularly the oral and written composition of the language period. H. S.

See Course of Study, Theory of; Content Subjects; Formal Subjects.

EXPULSIONS. — The expelling of pupils from school is scarcely used in modern disciplinary practice in the lower schools. The change of public attitude toward the function of elementary education in particular accounts for the discontinuance of expulsions. Education is regarded as a duty, not a privilege. The school laws compel attendance between certain ages, and the deliberate expulsion of a child by the school authority is incongruous with the idea of compulsory school attendance. If a child is not amenable to school discipline, he is merely suspended for the period necessary to discipline him, or is sent to a parental school or some other special institution specially devised to deal with juvenile incorrigibles. The practice of expulsion has a larger usage and warrant among higher schools and private schools. H. S.

See School Management; Truant Schools.

EXTENSION. — See Space.

EXTENSION WORK. — See Adults, Education of; Correspondence Schools; Evening Schools; Lecture Systems, Public; University Extension.

EXTENSIVE METHOD. — Any method of treating a subject which aims at a broad survey of the field rather than a highly detailed command of selected or typical aspects. In this sense a comprehensive treatment is contrasted with an intensive method of study. The relative value of extensive and intensive methods is a matter of discussion in almost all the so-called content subjects such as natural science, history, geography, literature, etc. H. S.

See Method Teaching; Intensive Method; Epochal Method.

EXTERNAL OBJECT. — The phrase "external object" or "world" is indicative of the peculiar problems of epistemology (*q.v.*). Mind, or consciousness, having been conceived as a peculiar private possession of an exclusively individual soul or self, the object of knowledge must be conceived as "external." A great variety of different relations have been, as a matter of fact, lumped together and confused under this caption. There is (1) the problem of space, whose elements are all external to one another; (2) of the relation of the body, as the organ of the self, to the rest of nature, which is external to the body; and (3) of the purposes of an agent to the natural conditions which are indifferent to these purposes or which resist their realization. If the problems appertaining to these relations be distinguished and disentangled, it is doubtful whether any special problem relating to an "external" object or "world" will be left. J. D.

EYE. — **Structure.** — The eyeball is set in a cushioned socket, against which it is held, and rotated, by means of three pairs of antagonistic muscles. It is approximately spherical in form, and has a maximum diameter of about twenty-three millimeters. The interior is divided into two chambers: the anterior chamber extends from the cornea to the iris and lens, and contains the aqueous humor; while the posterior chamber extends from the lens to the retina, and contains the vitreous humor. The outer wall of the eyeball is composed of three layers: (1) The sclerotic is a tough integument which covers the posterior sphere; its anterior process constitutes the (ellipsoidal) cornea; (2) the choroid consists essentially of a deposit of dark pigment; its anterior process constitutes the iris, in the center of which is a variable aperture, the pupil; (3) the innermost coating is the retina, which consists of an intricate network of receptors, connectors, fibers from the optic nerve, blood vessels, pigment, etc. The retinal structure is exceedingly complex, but the mechanism may be represented schematically as a system of bipolar and ganglion cells which bring the sensory end organs (the rods and the cones of the posterior layer) into communication with the fibers of the optic nerve (anterior layer).

The rods and the cones are not distributed uniformly over the whole retinal surface. At the region where the optic nerve enters the eyeball, there is a blind spot where sensory organs are wholly lacking; and in the fovea centralis (the region of clearest vision) only cones are found. In the paracentral region the cones predominate; while, as we proceed toward the periphery, the rods become relatively more and more numerous. This fact, together with other evidence, has led to the supposition that the rods are the more primitive, and the cones the more highly developed end-organs of vision. Little is known regarding the details of the retinal process which gives rise to visual sensation. Numerous attempts have been made to account for the phenomena of retinal stimulation, — the theory of Hering being most generally accepted, although the theories of Mrs. Ladd-Franklin and von Kries have also won adherents.

The movements of the eyeball are accomplished by means of six muscles, four of which (*recti*) apparently have to do with movements to the right, to the left, upward and downward, respectively ; while the two oblique muscles, which have a lateral attachment and operate through pulleys, serve to reduce or prevent the torsion of the eyeball.

Accommodation, or change in the refractive power of the ocular system, is brought about by means of a variation in the form of the crystalline lens. The lens is enveloped in a suspensory capsule, to which is attached the ciliary muscle. The arrangement is such that when the ciliary muscle is contracted, its tension upon the lens is reduced, and the lens, in virtue of its own elasticity, assumes a relatively globular form (appropriate for the focusing of near objects); while, when the ciliary muscle is not contracted, it lies in such a position that its lateral tension tends to flatten the lens, and hence to focus the system for distant objects (Helmholtz). J. W. B.

Hygiene of the Eye. — Since the eye is the organ of sense most used by school children, school hygiene is especially concerned with the health of this organ and its condition of refraction. In the normal condition the antero-posterior diameter is such that parallel rays of light are brought to a focus on the retina. This condition of refraction is called *emmetropia.* Deviation from this is called *ametropia.* Errors of refraction are roughly divided into three kinds : (1) *Hyperopia,* where the antero-posterior diameter of the eye is too short and parallel rays of light striking the cornea are brought to a focus behind the retina, that is, the eyeball is too shallow. (See HYPEROPIA.) (2) *Myopia,* where the antero-posterior diameter is too long and parallel rays of light are brought to a focus in front of the retina. (3) *Astigmatism* (*q.v.*), where there is an error in the refracting surfaces, either the cornea or the lens, usually the former.

Normal activity of vision usually depends upon the integrity of the visual organs, the condition of general physical health, and the condition of refraction of the eyes. In some cases, however, there is weakness of vision due to defect or disease where there is no error of refraction. This is called *amblyopia.*

The standard usually assumed for normal acuity of vision is the ability to read the standard Snellen type at a distance of twenty feet. This ability is represented by 1 or $\frac{20}{20}$, or, reckoned in meters, $\frac{6}{6}$. Snellen adopted this norm as the standard representing normal acuity of vision, but the standard is a conventional one. Stocker maintains that 1.25 should be taken as representing normal acuity of vision. As a matter of fact, he maintains that the acuity of vision most usually found among children is 1.50. In any case this is what he found in his investigations: 998 eyes among the boys, 972 eyes among the girls had a visual acuity of 1½, while only 232 eyes among the boys and 238 among the girls had a visual acuity of only 1.

The errors of refraction have been studied in hundreds of thousands of school children, and very significant results have been obtained. The eye of the child at birth is undeveloped. As a rule it is an hyperopic eye. After birth development proceeds gradually, and while we do not know just at what age the eye normally becomes emmetropic, investigators have often found that at the beginning of school life more than half of the pupils have hyperopic eyes. In the later grades the majority of eyes have become emmetropic, or passed through this stage and become myopic. The number of children with defective vision varies greatly according to different investigators. The number found depends on the fineness of the methods of testing used. Some investigators have found as many as ninety-seven per cent of all children with refractive errors of some kind, and probably few, if any, absolutely emmetropic eyes can be found. If, however, we consider the number that have such a degree of refractive error that it interferes with school work, the number is still large. American investigators with ordinary tests have usually found from 10 to 30 per cent of school children with defective vision. German investigators have usually found from twenty to forty per cent, although in many instances a much larger percentage. In England somewhat different results have been found from those in Germany. Tests have been made in London of perhaps half a million children under the able supervison of Dr. Kerr. On an average ten per cent of the children were found to have vision which is bad ($\frac{6}{18}$ or less) when tested by the teachers under the ordinary conditions of life. (*London Reports,* 1905, p. 34 ; 1909, p. 56.)

The sex incidence of refractive error found in London is noteworthy. Girls account for nearly seventy-eight per cent of Mr. Bishop Harman's hospital cases, and in the school returns seventy-five per cent of the children with poor or bad vision are girls. "The causes for this divergence in visual acuity in the sexes," says Dr. Kerr, "seem purely social. There is no evidence that the eyes of boys and girls differ in growth. Whatever common eye conditions are investigated, a similar incidence is found, *i.e.* more girls than boys affected, and in each case a social influence has seemed the most constant factor. Possibly the boys play in the open air, whilst the girls are confined more to the house, and the boys, doing no needlework, have an advantage, for their accommodation muscles are in a better state of tone on account of outdoor life, and at the same time less fatigued by school work, than is the case with the girls." (*London Report*, 1909, p. 57.)

Prolonged use of the eyes for near work is generally considered one great cause of myopia, or at least an aggravating condition ; and many writers seem to consider the school the chief causal factor in producing eye defects. Cohn, in his classic study of ten thousand children in Germany, some forty-five years ago, showed a very marked increase in the number of myopic pupils from the lower to the higher grades, and these and similar results have usually been accepted as showing the influence of the school. The evidence is by no means satisfactory, because, according to the view of Stilling and others, the myopic condition might have developed anyway, whether the children had attended school or not, on account of innate peculiarities of the eye. Other sources of error are also involved. For example, myopic children, being handicapped in outdoor activities, become more interested in books, and tend to remain in the school. Hence a large percentage of bright pupils are often found among those with defective vision. Recent studies have apparently demonstrated that conditions of refraction and acuity of vision are inherited. There may, however, be errors of refraction due to other causes that occur incidentally to individual growth, or that are acquired ; and it is possible that a number of causes may combine to produce such defects.

The question whether a given degree of refractive error should be corrected by lenses or not is always an individual one, depending largely on the general physical health, the condition of the eye, and the like. Adequate examination and the advice of a competent oculist should always be obtained.

Certain diseases of the eye concern the school. Among these are the various forms of conjunctivitis. This disease is an inflammation of the mucous membrane connecting the eyeball and the lids of the eye. Children suffering from this should be referred to the school physician or school nurse, where such officers are in attendance. The ordinary form, mere hyperæmia, is not contagious, but true conjunctivitis, of which there are several forms, is contagious, and epidemics are not rare. The most dangerous form is trachoma. (See TRACHOMA.) This is contagious, and investigations in New York City indicate that in certain schools of a large city it may be very prevalent and that the greatest care must be taken to avoid the spread of the disease. In New York City the cards for health inspection contain rubrics both for conjunctivitis and trachoma. The school nurses are not allowed to treat the latter disease, but if treatment is not provided by the parents, they must visit the home and explain the need of medical care. The danger of infection in this and other more serious eye diseases makes cleanliness imperative, and the use of individual towels should be required. Medical inspection for this and the other eye diseases is essential.

Specially important for the hygiene of the eye is suitable illumination of the schoolroom. (See LIGHTING.) The larger part of the light should come from above or from the left of the pupil; the ratio of window surface to floor surface should be one to five; the illumination of the darkest desk on the darkest day should be at least ten meter candles; the light should be, if possible, diffused sunlight; there should be no glare from surrounding buildings, from shining surfaces in the schoolroom, or from glazed paper, or the like, and there should not be great diversity in the amount of illumination. Hence there should be means of regulating the amount of light by curtains and the like. It should be remembered that the amount of light varies inversely as the square of the distance, not directly as the distance, from the source of illumination. Regard for this law of physics is important, not only in the lighting of schoolrooms, but in the case of home study with artificial light. The iris has an important function in regulating the amount of light that comes into the eye. In case of a bright light the iris diaphragm contracts, reducing the size of the pupil and shutting out much of the light. With dull illumination the pupil enlarges, allowing a larger amount of light to enter the eye. To a certain extent the iris equalizes the amount of light that enters the eye. Ruling out other factors the pupil expands inversely as the square of the illumination. Hence, if the amount of light is increased twenty-five fold, the amount falling on the retina is increased only five fold. The diversity in the illumination, however, is sometimes so great that it is impossible for the iris to regulate it adequately. The great variation in illumination likely to occur in our schoolrooms is shown by tests made by Professor Basquin, of Northwestern University. This investigator found that the amount of light coming through a square foot of clear glass in the roof at nine o'clock in the morning was only 67 per cent of the amount at midday, that at 4.30 P.M. only 27 per cent of that at 12.30. Also the variation during the different months of the year was very great, December having but 18 per cent the illumination found in June. These facts show the importance of ample illumination and of suitable curtains, and the like, for regulating the amount of light.

In the hygiene of the eye the following adaptation of the rules in the military schools in Germany is applicable in the public schools. (1) There should be such a division of instruction that the eyes will never be used longer for near work than half or three quarters of an hour without interruption. Proper alternation of work and rest is to be provided for. (2) There should be frequent exercise in looking at things at a distance in order to relieve the eyes. (3) There should be much movement in the outdoor air, gymnastic plays, for example. (4) Reading by unsatisfactory light, especially at twilight, should be avoided. (5) The pupils should take a proper position in reading and writing. The eyes as much as possible should be kept at a distance of at least twelve inches from the work. (6) Spectacles should be used only by order of a physician. (7) The near-sighted pupils should have their place in a class allotted to them with due regard to the condition of their eyes. (8) The light in reading, writing, and drawing should come from the left or from above the pupil, and the object should be completely lighted. (9) School instruction by artificial light should be avoided as much as possible; when it cannot be avoided, then reading and writing should be reduced to a minimum and drawing omitted altogether. (10) A large handwriting should be required, the height of the small letters amounting to at least three millimeters. The vertical or nearly vertical Roman script should be specially used. (11) The use of writing books with a network of lines should not be permitted. (12) Tight clothing about the neck should be avoided while reading, writing, or drawing.

Dr. Ziegler has advocated eye gymnastics as especially important exercises for preventing myopia. The exercises that can be used have been described by him somewhat in detail. His principle is that the eye can be trained just as well as the muscles of the body. This eye gymnastics embraces looking exercises, judgment of distances, and orientation.

While the result of recent scientific studies is to indicate the importance of heredity and other factors rather than the school in the production of eye defects, the emphasis can hardly be put too strongly on the hygiene of the eye, cleanliness, care of the general health, and periodic tests by competent persons. Eyestrain is the cause of many serious symptoms, headache, dizziness, indigestion, nervousness, and the like. The handicap to school work is often serious. The improvement from the correction of the eye defects in individual cases is often a revelation to teachers.

The specially important things demanded by school hygiene are the following: (1) Tests of the eyes of all school children once a year by teachers and competent oculists. (2) The correction of errors of refraction by expert advice. (3) The observance of the well-accepted rules for the hygiene of the eye. W. H. B.

See ASTIGMATISM; HYPEROPIA; MYOPIA; READING; LIGHTING; TRACHOMA.

Movements of the Eye. — The eye muscles rotate the eyeball within the head in such a way that images or objects at the right or left can be projected upon the retina; furthermore, the two eyes can converge upon the same object, whether that is near at hand or far away. (See CONVERGENCE.) Many abnormalities in eye movements arise as a result of lack of exact symmetry in the muscles controlling the eyes. Squinting results as an extreme type of this kind of lack of symmetry. The pathology of eyestrain has not been given the attention which it deserves in education. Many persons are subjected constantly to the necessity of excessive contraction of one or more of the ocular muscles in order to converge the two eyes properly. This induces fatigue, and often leads to extreme exhaustion, and other consequences which are far-reaching in their significance for personal health and behavior. In psychology, the eye movements have been much emphasized as significant in explaining the processes of visual perception. Whether the eye movements supply independent sensations or not has been a subject of vigorous discussion. The inner muscular adjustments, involving chiefly the lens (see ACCOMMODATION), are not usually regarded as eye movements in the proper sense of that term.

C. H. J.

Vision, Tests of. — The stock test of vision as administered in schools consists of a simple determination of capacity to read test types (usually of the Snellen pattern) at a distance of twenty feet. While this test is better than none at all, it fails to detect hyperopia (over-sightedness), which has, in some respects, more serious and far-reaching consequences than myopia (short-sightedness), and it only indirectly reveals the presence of astigmatism.

The test here recommended, which follows, in the main, the suggestions of the American Ophthalmological Society, is designed to remedy this insufficiency. The examiner needs a test card for acuity, a test card for astigmatism (preferably Verhoeff's chart), a simple trial frame, two − .75 D. and two + .75 D. spherical lenses (48-inch focus, English system), and one blank disk. (Two pairs of cheap spectacle frames, fitted the one with the convex, the other with the concave lenses, may replace the trial frame and test lenses.) Place the test type on the wall or stand, on a level with the pupil's eyes, in a strong, even illumination (though not in direct sunlight), at a distance of twenty feet (six meters) from the pupil. Note any indication of soreness or inflammation of the eyes, and ascertain whether the pupil suffers from frontal or occipital headache after using the eyes for near work, whether he has been previously examined and with what result, whether he has ever worn glasses, and why, if this is the case, they have been discarded. Adjust the trial frame. Place the solid disk before the pupil's left eye (or hold a card before it), and instruct him to keep both eyes open. Find the smallest sized line of type in which at least three fourths of the letters can be read. (Most children need urging and encouragement to induce them really to do their best.) Record the result. Whatever this may be, always try next the effect of the + .75 lens. If the eye is emmetropic (normal refraction), vision will be somewhat impaired. If vision is not impaired or is somewhat improved, the eye is *hyperopic*. If, in the first test, vision is 1 or $\frac{20}{20}$, and if, in the second test, vision is impaired by the convex lens, try the effect of the − .75 lens. If vision is now improved, the eye is presumably *myopic*.

If either hyperopia or myopia is indicated by these tests, or if headaches or inflammatory conditions indicate eyestrain, replace the test type by the astigmatic chart, and ask the pupil whether one or more of the radiating "wheel spoke" lines seem to him sharper or blacker than the others. If he answers in the affirmative, *astigmatism* is present. This result may be confirmed by causing the pupil to move his head from one side to the other, in which case the location of the blacker lines should shift with the movement. The degree of astigmatism may be roughly estimated by the positiveness and readiness of the pupil's answer; its axis may be determined approximately by his designation of the blackest line or lines. It must be remembered that astigmatism may exist alone or in conjunction with either hyperopia or myopia.

If the vision is subnormal, but no form of ametropia (hyperopia, myopia, or astigmatism) can be demonstrated, the defect may be ascribed to *amblyopia* (weak sight). Place the blank disk before the right eye, and proceed similarly to test the vision of the left eye. Teachers should never prescribe lenses on the strength of these tests, but should refer children whose eyes are presumably defective to a competent specialist.

Tests for *muscular imbalance* (*heterophoria*) are only rarely undertaken in school examinations, though the Maddox rod and the Stevens stenopaic lens afford simple devices for the purpose. Manifest disturbance of the visual axes (strabismus, squint, heterotropia) should, of course, be recorded, particularly in testing the vision of young children, since these deficiencies must be taken in hand at an early age, if they are to be corrected by the oculist.

Tests for *color blindness* are, perhaps, equally rarely undertaken, though they have considerable pedagogical and sociological significance. A scientifically satisfactory test of color blindness which shall detect color weakness and other anomalous forms of color vision as well as the usual red-green blindness, requires materials or appliances, such as the Nagel tests, that are not on sale save to physicians or psychologists, and requires, also, some technical acquaintance with the psychology of color blindness. But the well-known Holmgren colored worsted test is easily administered, and valuable so far as it goes. In conducting it, either the full or the abbreviated procedure may be followed. For the first remove the three large test skeins, — pale green, red, and rose, — and scatter the remaining skeins over a light gray cloth or paper. Ask the pupil to select all the skeins that resemble the pale green test skein, which is handed to him first. Explain that there are no two skeins alike, and that an exact match is not required. If hesitation appears, or if grays, browns, and reds, as well as greens are selected, continue the test by the use of the rose skein. The typical red-green blind will then select some blues and purples, less often grays or greens. Finally, the red test skein may be used, though many color-blinds make no errors with it, on account of its strong saturation. Preserve a careful record of the skeins selected by pupils who deviate in any particular from the normal. For the second, or abbreviated procedure, place irregularly on the cloth four green skeins and eight "confusion" skeins of gray, brown, and pink. Give the pupil the pale green standard, and require him to pick as rapidly as possible four skeins that match the test skein (in the sense above described). If this cannot be done within four or five seconds, or if mistakes occur, test further by the full procedure.

NOTE. — The appliances mentioned above may be bought from any well-equipped dealer in optical goods, who will also import the Nagel color blindness testcards for those to whom they may be sold. More explicit instructions for conducting these tests, together with typical results and conclusions, will be found in Whipple, *Manual of Mental and Physical Tests.*

G. M. W.

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For structure of the eye see any general work on anatomy or on psychology, which deals with the physiological aspect. For hygiene of the eye, see:

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EYE AND EAR MINDEDNESS. — It is a well-known fact that persons vary widely in the efficiency with which they can use the eye as compared with the ear. This difference has to do in part with the mere keenness of the sense organ as such, *e.g.* in seeing or hearing objects and sounds at a distance, in part with the retention in memory of information gained either through the eye or the ear. Psychological observation also tends to indicate that in some persons thought processes of a rational kind are carried on sometimes by means of visual material and sometimes by means of auditory material. There is with some individuals a marked preference for one of these forms of thought material or imagery, as compared with the other. These distinctions suggest three headings under which the matter will accordingly be treated. (1) Keenness of sensations; (2) efficiency of memory; and (3) relative value as material for reflective thought, and thus for the control of conduct.

1. Two general causative influences may produce a preference for the use of the eye or the ear as end organs of apprehension, (*a*) organic defect in one of these senses, as contrasted with normality in the other; or normality in one as contrasted with hypersensitiveness in the other; and (*b*) organic conditions of the brain favorable to one sensory region as compared with the other. For example, an individual who suffers from deafness in any degree is quite certain to make every possible use of vision and the other senses, rather than to rely upon auditory experience. On the other hand, an individual who may enjoy extremely acute vision because of the extraordinary perfection of the structure of the eye, may evince a preference for that mode of apprehension, even though hearing is normal. There are, however, abundant instances of individuals who possess a distinct preference for sensations of one or the other variety in whom no explanation based upon the mere structure of the sense organ appears to be adequate. Such persons are said to be more interested in things which they see, for example, than in things which they hear. Such preferences are presumably to be connected with differences in brain organization, which result in a readier response to one kind of stimulation than to the other.

One must recognize within this range of differences a number of subordinate variations. For example, in the case of auditory sensations an individual may be relatively insensitive to sounds of all kinds, so that to attract his attention or to make him understand readily requires speaking in a tone of voice louder than is necessary in ordinary conversation. As contrasted with this type of defect, which is a common consequence of catarrhal troubles and of many febrile diseases, is to be mentioned defect in the discrimination of tones, as in the case of persons who cannot reproduce a simple melody, who cannot discriminate from one another adjacent tones in the musical scale. Many individuals are able to make relatively rough discriminations, who are nevertheless markedly inferior to the normal person, who is capable of discriminating much minuter differences in pitch. The medical specialist often meets with individuals manifesting a type of disorder leading to the appearance of so-called "tone islands." The patient may, for example, be unable to distinguish any pitch differences in the five or six notes lying in the middle of the piano scale, although he is substantially normal in his power to discriminate tones in the remaining portions of the scale. Again, individuals may enjoy relative normality of hearing as regards the points already indicated, while they are somewhat defective in their power accurately to localize the source of sounds. This type of difficulty is generally associated either with total or with partial deafness in one or both ears. Evidently, however, a defect in hearing which affects either the power to localize or the power distinctly to understand sounds of normal intensity will exercise a discouraging influence on the use of the ear as an organ of apprehension. Defects of the type mentioned second, *i.e.* those concerning the discrimination of the pitch of tones, will obviously militate against the appreciation of, and participation in, music of most kinds.

In the case of vision we meet with a similar series of defects. There may, for instance, be malformations of the eyeball and its contents, or of the muscles of the eye, leading to indistinct or painful vision. The troubles which the optician has to deal with are chiefly of this character, and need not be described in detail. Over against these are deficiencies in color vision, with color blindness as the extreme representative, and with various degrees of imperfection in the power of color discrimination as intermediate between this extreme and normal color vision. Evidently a person suffering in any serious degree from one or more of these forms of visual defect is likely to be influenced toward the cultivation of all available sensory substitutes for vision. This is at least true of the serious defects in the distinct vision of objects. It is much less certainly true of the case of color blindness which in its more serious forms necessarily precludes any successful cultivation of the æsthetic interest in color, even though it leaves untouched the normal sensitiveness to the visual objective world. As a matter of fact, color blindness is very apt to result in augmenting the sensitiveness to other aspects of the visual world, such as form and brightness.

2. Certain peculiarities of the memory process will now be dealt with. It will be understood that memory stands in such relations to the sense activities that the points just rehearsed bear inevitably on the memory case. In considering the memory processes, there must be distinguished (*a*) those influences which affect the quickness of learning or impressing, (*b*) those which concern the permanency of retention, and (*c*) those which have to do with ease and promptness of recall. It is a matter of common observation, which is well supported by experimental research, that some persons can memorize a given material more quickly by seeing it than by hearing it; and the converse case is often met with. Evidently such differences may have their explanation in organic variations either in the structure of the sense organs or the brain, as indicated in the paragraphs preceding; or they may find their explanation in terms of habituation and practice, the individual for one reason or another having disciplined one mode of learning more fully than the other. So far as concerns permanency of retention, there is no reason to believe that material impressed upon the ear is either better or less well remembered than that impressed upon the eye. At least this is true so far as concerns any universally valid principle. Particular individuals undoubtedly retain better in one way, and other individuals retain better in the other way. In learning verbatim, the general fact is that material which requires longer for its original learning is retained better than material more easily learned. But there are many exceptions to this, and in any case sufficient repetition will stamp in any material whatever with a high degree of permanency. The same thing is true as regards ease and promptness of recall. There is no reason to think that one type of material is *per se* better than any other.

At this point the reader needs to be safeguarded against a very common fallacy. Psychological writers have often assumed that because one learns most readily through the eye, for example, that one therefore *recalls* his experiences primarily and dominantly in visual imagery. This may or may not be the fact, but it is certainly not in any sense universally true. It is equally untrue that one who learns most easily through the ear can be safely inferred to recall his experiences in auditory form.

Why one method of memorizing should be preferred to another may perhaps be attributable in part to the sensory differences already mentioned, but it seems much more likely that it has to do with variations in the organization of the brain where a higher sensibility and a greater retentiveness of one region as compared with another is surely the natural thing to be expected. Habit must also play a very important part, and although the original preference for one form may have been essentially accidental, if it once becomes established, it may persist indefinitely.

3. The same kinds of differences which are met with in sense apprehension and in memory also characterize the trains of imagery which constitute the basis of imagination and which are for many people the material of reflective thought. These images (the mental copies of sensations and perceptions) may be of many other kinds beside visual and auditory, *e.g.* tactual, although these two forms certainly share with motor imagery the dominating place in consciousness. It has been generally believed in recent years that in the thought processes of any given individual, some one form of imagery prevailed markedly over other forms. More recent investigations tend to show that individuals make use as a rule of several different kinds of imagery, particularly visual, auditory, and motor (some of it serving to represent *objects* and some of it representing *words*, whether as seen, heard, or spoken). These different forms of imagery are likely to be more or less intermingled in any complete chain of thinking, and some one type of imagery is almost certain to be preferred for special kinds of thought. For example, an individual may reason out simple mathematical problems almost altogether in terms of visual imagery, whereas he may be perfectly able to use auditory imagery, if he desires to recall a bit of music. He may use visual, objective imagery in solving a perplexity in a geographical problem, whereas he might use auditory word imagery (generally combined with vocal, motor imagery) in thinking out a problem in algebra or a problem in ethics. There is thus rendered possible a very elaborate shunt system in most minds, by which the several varieties of imagery available by the individual are likely to be brought into use when for any reason the commoner forms are temporarily less accessible.

In this field, also, the explanations of the individual's preferences may be sought either in the original structure of his brain, or in the accidental exigencies which may have caused him to build up his habits of thought around one kind of imagery rather than another, even though at the outset the one had been as available as the other. Observations on children lead one to believe that there is a rather strong native predisposition to certain forms of imagery as compared with others. No doubt this would be found connected with hereditary traits in most cases, provided we were in a position to command the necessary evidence.

It is not possible to say that either auditory or visual material is *per se* superior the one to the other, at least for the ordinary purposes of memory, of thought, and of the control of conduct. But it is perfectly clear that for certain æsthetic interests the matter is of first-rate consequence. To attempt to teach a child music who has defective powers of discriminating pitch, or to expect an individual to take any serious interest in music who cannot command auditory imagery, is essentially ridiculous, and certain to issue in much hardship for the child and much futile labor for the teacher. Adequate tests on these matters should certainly be instituted in all cases where children appear to be unresponsive to such training. Similarly in the case of drawing and painting. A child who is seriously defective in distinctness of vision is not likely to be forced into the artistic use of the pencil or the brush. Nor are children who are seriously deficient in color discrimination likely long to be subjected to training in the use of pigments. Nevertheless, there are not a few cases on record in which this sort of absurdity has been practiced. It is much more likely, however, that children who are seriously defective in visual imagery should continue to be subjected to training in drawing and painting, and in such cases teachers are apt to cherish the hope that sooner or later the powers of imagery may be thus developed. We are not in a position at present to state definitely within what limits such defective imagery can be trained. But there seems no reasonable ground to doubt that certain children are born with limitations in this direction, which, practically speaking, cannot be altogether overcome, and it is certainly a matter of consequence to determine as early as possible whether or not such limitations exist.

The question is often asked whether it is desirable to attempt to train forms of imagery which the child does not naturally employ. In a practical way this inquiry may be confined to the images of vision, hearing, touch, and movement. The only reply which can be given is based upon general considerations rather than upon adequate experimental evidence. There can be no doubt that in a general way it is desirable to be able to use any of these forms of imagery at will. A mind in possession of such capacities is a richer and more flexible instrument than one deprived of some one of these avenues of apprehension and appreciation. But it may well be doubted whether in the case of a strong predisposition to specialize in one or two directions, there is any compensating advantage to be gained in return for the time and effort expended in trying to develop the unused form. Common sense would seem to indicate that the wise course would involve a serious effort to call out the missing type of response, but that, if a brief period of such discipline produced no reaction, it would be presumably unprofitable to attempt to force what the evidence would then indicate as an unnatural line of development. Moreover, it is to be remembered that most forms of practical efficiency are conditioned by the flexibility, rapidity, and accuracy of our manipulations of the materials of thought, rather than by the use of any particular kind of material. Thought functions in a vicarious way, and the most remarkable and successful results often emanate from the use of a very circumscribed kind of material.

In conclusion, it is to be recognized that, however much we may wish to develop and train a given kind of imagery, we are at present far from possessing any confident knowledge of how to proceed to that end. Broadly speaking, the simplest and most commonly successful methods involve the use of stimulation to one or another sense organ with instructions to the subject to recall as nearly as he can the exact manner in which the stimulus looked, or sounded, or felt, etc. J. R. A.

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EZRA, RABBI BEN. — See Ibn Ezra, Abraham ben Meir.

FABLES. — The term in a broad sense is applied to a great variety of imaginative stories, but it is also used in a more restricted sense to designate an animal story with a moral attached. This latter class of fables may be divided into two distinct categories: (1) Popular fables, those which are handed down by word of mouth, and have circulated among all classes of society in every age and in every clime. This category belongs to the domain of folklore (*q.v.*). (2) Literary fables, those which descend from writer to writer, and which pass from one literature to another in a written form. It is this class of fables of which an extensive educational use has been made for more than two thousand years past.

Aside from numerous references to the use of fables in the schoolroom which are to be found in classical Greek and Latin authors, there have been preserved by fortunate accidents two schoolboy slates (wax tablets), dating from the third century of our era, which actually contain the fables written at the behest of the schoolmasters. One of these was found at Palmyra in Asia Minor, and contains the text of several Greek fables; the other was found in Egypt, and gives a Latin text which has evidently been translated from the Greek.

In the early Middle Ages the fables of Flavius Avianus were commonly used in the schools as elementary reading for boys learning Latin. This practice accounts for the very large number of manuscripts of this work still extant, and for the many references to its author found in the works of medieval writers. Sometimes the fables of Romulus were used as well as those of Avianus, and in this case the name used to designate them was commonly Æsopus. Thus Otloh testified to the use of Avianus in

German schools in the eleventh century; and Egbert of Liège, a teacher in the cathedral school at that place, wrote about the year 1023 a textbook for boys learning Latin, in which he introduced a number of the fables then current in a written form. Conrad von Hirschau in the twelfth century likewise refers to the use of fables for purposes of instruction, as does Hugo von Trimberg in the next century, writing from a village near Bamberg.

Many rhetoricians and schoolmasters introduced fables in their books for beginners, and in the twelfth century Walter the Englishman assisted his royal pupil to versify the fables of Romulus in elegiacs. This collection was later a great favorite in the schools, and eventually took the place of the older collections previously employed. Transformed in various ways, its vogue lasted for some four centuries. In the fourteenth century Stephen Patrington wrote a commentary to these fables, intended to increase their usefulness in English schools; and in Italy they were supplied with an Italian commentary for the use of schoolboys. In this latter form they were frequently published toward the end of the fifteenth century and during the whole of the sixteenth. But they had also been included in a popular textbook called the *Auctores Octo*, and had thus been printed over and over again in various places, even as far off as Spain.

When in the sixteenth century La Fontaine composed his deservedly famous fables, a fresh impulse was given to the use of these stories in the schools, an impulse whose influence is still strongly felt in many parts of the world. In France they have become a regular school classic, and in Germany, England, and other countries they are still in great demand. Even in America there have recently appeared two editions designed for use in colleges and secondary schools.

In England Bewick's fables are favorites with the children, in Germany those of Wilhelm Hey, in Spain those of Samaniego. Indeed, there has been a tendency of late years to push the educational use of fables back into the kindergarten stage. For older pupils readers and chrestomathies of all sorts usually contain at least a few fables, and it is quite a common thing to find them at the very beginning of the texts printed in such books.

The fable at its best would seem to be the precipitate of century-old observation of animal traits, and as such its appeal to childish minds is at once immediate and powerful. G. C. K.

See Æsop: Folklore; Myths.

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FABRICIUS, JOHANN ALBERT (1668–1736). — One of the ablest classical scholars in Germany at the beginning of the eighteenth century, and founder of the study of the history of classical literature. He showed marked ability as a student at school and at the University of Leipzig, where he studied medicine, theology, and literature. In 1694 he was employed by a pastor in Hamburg as assistant in his valuable library. Here he wrote the *Bibliotheca Latina* (1697), a literary history with biographical and bibliographical notes. He was ordained and was an occasional preacher in Hamburg. In 1699 he was appointed professor of moral philosophy and eloquence in that town, and refused numerous invitations from other important German universities. For a short time he was also rector of the Johanneun (1708–1711). In addition to his classical interests he was instrumental in establishing the *Teutsch-übende Gesellschaft* for the cultivation of the vernacular through translations and original works. Fabricius' most important contributions were in the field of history of classical literature. The Latin work mentioned above was supplemented in 1734–1736 by *Bibliotheca Latina mediae et infimae Aetatis.* His great work was the *Bibliotheca Graeca* in fourteen volumes (1705–1728). In the field of classical antiquities he issued in 1713–1716 the *Bibliotheca Antiquaria* and a new edition of Banduri's *Bibliotheca Nummaria* (1719). Besides these works he edited Sextus Empiricus, *Dio Cassius, Marinus de Vita Procli*, and wrote several theological works. His biography was written by his son-in-law Hermann Samuel Reimarus (*Commentarius de Vita et Scriptis Johannis Alberti Fabricii*, Hamburg, 1737.)

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FACIAL ANGLE. — See Craniometry.

FACILITATION. — See Habit.

FACT. — Literally, something done, effected. Since what is effected is secured, the element of assurance, of certainty, of conviction is generally implied when anything is referred to as a fact. Logically, the term "fact" is thus antithetical to idea, guess, hypothesis, theory, fancy. The distinction is thus a relative, not an absolute, one; that is to say, certain things which were once unquestionably accepted and so had the status of "fact" may after a time become doubtful, or even rejected; then they are treated as ideas, or, if entirely rejected, as mere ideas or fictions. On the other hand, the progress of science often gives such security to what at first was a theory that it is admitted as fact. Since every genuine judgment (as distinct from a verbal enunciation of something already known) involves an inquiry, or represents "going from the known to the unknown," every judgment involves both "fact," *i.e.* something taken for granted, and "idea," *i.e.* a hypothetical meaning emphasized to reinterpret the fact. In the procedure of advancing from the known to the unknown, "fact" is the subject of judgment, the situation so far as known, while the predicate is the unknown so far as an idea tentatively and hypothetically stands for it. (See JUDGMENT.) Educationally, the problem accordingly is to utilize facts, not as ends in themselves (the gradgrind, dry-as-dust type of instruction), but as material of judgment, *i.e.* for advance into the hitherto unknown. J. D.

See IDEA; INFORMATION; TRUTH.

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FACTOR. — A positive integer that is contained without a remainder in a positive integer is called a *factor* of the latter. Thus, 2, 4, 5, 7 are factors of 140. In the older mathematics 1 was not considered a number (see UNITY), and hence it was not considered a factor of any number. The product of several factors was occasionally known as a *factus*, as in the works of Ramus and Schonerus (*qq.v.*). The broadening of the number concept and the developing of an algebraic symbolism have led to the occasional removal of some of the primitive limitations, so that -2 is occasionally considered a factor of 4, although in the theory of numbers (*q.v.*) the restriction to positive integers is still maintained. In algebra the ancient usage is followed as far as possible, but it becomes necessary to recognize other kinds of factors. Thus we say that: a is an algebraic factor of ax, although x may turn out to be a fraction; $\frac{1}{a}$ is a factor of $\frac{1}{ax}$ within the domain of rationality, although not within the domain of integers; $-a$ is a factor of ax, although not within the domain of positive integers; $\sqrt{a}$ is a factor of a, although not within the domain of rationality; and so on.

This expansion of the idea of factoring is necessary in the solution of equations. Thus to solve the equation $x^2-a=0$ we may say that $(x+\sqrt{a})(x-\sqrt{a})=0$, and equate each factor to zero. We have here factored within the domain of rationality as to x, but not as to a. In elementary algebra we are likely to see more of this expansion of the idea of factor.

The subject of factoring in algebra occupied little attention in the United States until the last quarter of the nineteenth century. It then became very popular with teachers, and was carried to an extreme from which there has of late been a decided reaction. The subject has two manifest applications: (1) to the reduction of fractions to lowest terms, and (2) to the solution of equations. As to the first, there is a decided tendency at present to limit the style of fractions under consideration to those that the pupil is liable to meet in elementary algebra. This has lessened the number of cases of factoring necessary for the reduction of these forms to simpler terms. With respect to the use of factoring in the solution of equations, it is evident that the binomial factor is the important consideration, and hence much emphasis is needed upon the so-called Remainder Theorem (or Factor Theorem, as it is sometimes less satisfactorily named), a theorem by which we determine if $x-a$ is a factor of $f(x)$. From the point of view of actual use, this theorem is the most important one in elementary algebraic factoring. D. E. S.

FACTOR OF CONSCIOUSNESS. — See ELEMENTS OF CONSCIOUSNESS.

FACTORY, CHILDREN IN. — See CHILD LABOR AND EDUCATION; CHILDHOOD, LEGISLATION FOR THE CONSERVATION AND PROTECTION OF; FACTORY SCHOOLS.

FACTORY INSPECTION. — See CHILD LABOR; CHILDHOOD, LEGISLATION FOR THE CONSERVATION AND PROTECTION OF.

FACTORY SCHOOLS. — A general term given to the schools which were established in England in the first half of the nineteenth century in factories or close to factories for the education of young employees. The employers in certain industries were compelled by factory acts to provide for the education of the children whom they employed. Thus the act of 1802 (42 Geo. III, c. 73), among other provisions for the welfare of apprentices in cotton and woolen mills, provided for their education during part of every working day for the first four years of their apprenticeship, and also for their religious education on Sunday. But little was done as a result of this act, and the act of 1819 made no educational provision. The Factories Acts of 1833 (3 and 4 Will. IV, c. 103), of 1844 (7 Vict., c. 13), and 1847 (10 Vict., c. 29) extended the provisions to an increased number of industries and introduced the half-time system, by which no child under eight could be employed in a factory, and children between eight and thirteen must attend school for three hours a day, if employed every day, and, if working on alternate days, then school attendance was required for five hours. Parents and employers were made liable for neglect; the employer had to pay the schoolmaster a penny in the shilling of the child's wages, and the schools were placed under the supervision of the factory inspectors.

While a few of the employers took their responsibility seriously, they formed a very small minority. The majority of the schools provided under the acts were mockeries of education; not only were many of the schools unsanitary, but the teachers were utterly incapable. But these schools are important in the history of English education as elements in the development of elementary schools. At the same time, this factory legislation introduced the pernicious half-time system (*q.v.*), the abolition of which is now under consideration.

Another type of factory school is that attached to factories for the industrial and vocational education of young employees. The new type of apprenticeship in large factories which has recently sprung up involves the training of apprentices in such special schools.

See Apprenticeship and Education; Child Labor; Industrial Education; England, Education in.

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FACULTY. — The term "faculty" is closely related to the term power, facility, capacity. Historically, the word was originally closely bound up with the Aristotelian distinction between potentiality and actuality. An acorn is an oak in potentiality, not in actuality. Actuality means the thing in full operation, in completely functioning activity; potentiality means the power of becoming the actuality. A man's faculties are thus the potentialities which, if exercised, result in specific acts and operations. A man has the "faculty" of memory, even when he is not remembering, etc. At a later period, however, the Aristotelian sense of potentiality dropped away from the term "faculty," and it was used as a causal energy to explain certain acts. The soul was fitted out with a number of ready-made faculties ; thus a recollection was accounted for by referring it to a faculty of memory which produced it, and so on. When, however, mental acts had been, proceeding on this method, quite exhaustively classified, it was seen that the result was barren for purposes of explanation, since the "faculty" was simply an abstract name for exactly the things which in the concrete it was supposed to explain. In England the associational school, and in Germany Herbart, was especially active in the overthrow of this barren "faculty psychology." In education, the doctrines of ready-made faculties sharpened by exercise and of formal discipline (*q.v.*) stand and fall together.

The term was much more freely used in the earlier stages of psychology than at the present time. It was especially useful at a period when psychology concerned itself chiefly with the classification and description of mental processes. Thus, Sir William Hamilton (*q.v.*), in his discussion of mental powers (*Metaphysics,* Lecture XX), enters into an elaborate historical and critical discussion of the various faculties, and presents a complete system of subdivision of the knowledge side of experience, as follows:

Cognitive Faculties
- I. Presentative
  - External = Perception.
  - Internal = Self-consciousness.
- II. Conservative = Memory.
- III. Reproductive
  - Without will = suggestion.
  - With will = Reminiscence.
- IV. Representative = Imagination.
- V. Elaborative = Comparison-Faculty of Relation.
- VI. Regulative = Reason- Common sense.

In the historical discussion by which he supports this division, Hamilton brings into sharp relief one of the difficulties of this type of consideration. He points out that St. Thomas "held that the faculties were distinguished not only from each other, but from the essence of the mind"(page 272). The view here referred to was a very easy one to fall into. When a faculty, such as memory, is impaired, and another, such as perception, is apparently undisturbed, it is very natural to distinguish the faculties from consciousness in general, as though the faculties were separate limbs or members of the mind.

In contrast to St. Thomas, Henry of Ghent held "that the faculties are really distinguished from each other, but not from the essence of the soul (page 272). Hamilton quotes with approval, as expressing his own view, a passage from Addison: "That which we call the faculties of the soul are only the different ways or modes in which the soul can exert herself" (page 268).

The foregoing statement of the doctrine of faculties could be indefinitely expanded by referring to other systems of classification of mental powers. One system of such classification which is popularly known is that employed by the pseudo-science of phrenology. Combativeness, reverence, perception of form, of number, and of color, are here regarded as separate members of the conscious whole. All of these systems of classification are open to at least two fundamental objections. First, they distinguish classes of mental powers which are in no sense mutually exclusive. Thus, to distinguish between memory and imagination is to cause endless confusion, for it is altogether impossible to treat of our concrete experiences without recognizing that any real experience is at once conservative, reproductive, and representative. Second, when explanatory psychology attempts to account for mental processes, the faculties prove to be wholly fictitious units. Perception of form is inexplicable without reference to memory, and reverence is not seated at a point in the nervous system which differs from that at which imagination is located.

Wundt makes a vigorous attack upon faculty psychology as follows: "Class concepts were formed.... Such concepts are, for example, sensation, knowledge, attention, memory, imagination, understanding, and will. They correspond to the general concepts of physics — such as weight, heat, sound, and light. Like those concepts of physics, the derived psychical concepts . . . contribute nothing whatever to the explanation of the facts. Empirical psychology has, however, often been guilty of confounding this description with explanation. Thus, the *faculty psychology* considered these class-concepts as psychical forces or faculties, and referred psychical processes to their separate or united activity." (*Outlines of Psychology,* page 12.)

When psychology began to explain mental processes as well as describe them, the older classifications quickly gave way to new types of consideration. Sensory processes and motor processes came to be recognized as of cardinal importance because of their relation to physiological structures. The scheme of psychological classification (*q.v.*) underwent a radical change. There is, to be sure, need of a system of classification now quite as much as at earlier stages of the science, but this classification is dominated by explanatory rather than by purely descriptive motives. For example, attention is not treated as a separate entity in consciousness, because it is a general fact of all experience. Attention is a term which is very useful in description and discussion, but it is not a separate limb of consciousness. The term "faculty" has been very largely dropped by careful writers because of the many discussions which have centered about it, and because of the implication which it might introduce into psychological and educational treatments of present-day topics. Nevertheless, there is in current discussions a certain tendency to commit some of the fundamental fallacies of the earlier faculty psychology. The opponents of the doctrine of formal discipline, in their efforts to show that there is no such general training as has frequently been assumed, are subdividing consciousness into separate and distinct modes of activity, hardly less rigid and atomic than were the faculties. Thus, the perception of squares has been regarded as so highly specialized a function that it must not be confused with perception in general. The attack upon the general faculty of perception has thus led to a belief in many faculties of perception. These many faculties which might now be designated faculties for perception of squares, circles, triangles, etc., are separate and distinct in their character, and in their training. Education must cultivate each in its order, we are told, or the individual will suffer from the atrophy of his special faculties. This modern form of faculty psychology is quite as objectionable as the older form. The only rescue from this subdivision of consciousness is through a thoroughgoing functional treatment of mental life. (See Psychology, Functional.)

When consciousness is recognized as an organized system wherein all of the powers are what they are by virtue of types of organization, there will be no tendency to break up mental life into faculties, or separate modes of activity.

The separate modes of activity may continue to be distinguished and designated for purposes of description, but explanatory science will dominate even descriptive phases of the science. See Formal Discipline; Psychology, Functional.

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FACULTY. — See University.

FACULTY PSYCHOLOGY. — See Psychology, Faculty; Faculty.

FADS, EDUCATIONAL. — A term of criticism and sometimes of derision, applied to those features or parts of school work which seem to be of an ephemeral nature or of little permanent value, and which are being urged for adoption, or, having been adopted in some places, are apparently being overemphasized. Just what constitutes an educational fad depends much upon the individual point of view. Often the new and apparently impractical ideas of one decade are accepted as worthy additions to instruction by the next. Froebel and the kindergarten, and Horace Mann and his idea of normal training, were once ridiculed and regarded as visionary, and those who advocated their introduction were declared to be following educational fads. The same was true later on of manual training, domestic science, nature study, the high school, technical training, and other new subjects. To some an educational fad is anything except the seasoned and well established fundamentals of education, such as reading, writing, spelling, arithmetic, geography, and grammar. By such persons such subjects as music, calisthenics, manual training, and domestic science are still classed as fads. To others, who accept these newer subjects as substantial additions to our school curriculum, other newer proposals, such as directed play, vacation schools, vocational training, medical inspection, health supervision, and parental schools are in the nature of fads. With still others the term is used in a still more restricted sense, and is used to designate only unphilosophical and unpedagogical attempts to satisfy popular clamor or the passing fancy of the time. The term is commonly applied to new ideas and proposals, and what is at first termed a fad and often ridiculed is not infrequently accepted later and incorporated as a part of our regular school work. E. P. C.

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FAGGING. — It is strange that, while fags and fagging occupy so large a space in all school literature in England during the last century, whether in lives of famous men, school histories, or official reports of commissioners, not a trace of it can be found before the last quarter of the eighteenth century. To read some writers one might suppose that the institution of fagging, that is to say, the making of small boys do menial offices and dirty work for big boys, was the essence of the so-called "Public School" system on which England prides itself, and that it had descended from immemorial antiquity and made "Englishmen what they are," whatever that might be. In point of fact, it does not seem to be heard of in literature before the last quarter of the eighteenth century. In the two most famous documents which described school life, the *Consuetudinarium* at Eton prepared by the Headmaster William Malim for a royal commission in 1561, and *De Collegio seu potius Collegiali Schola Wiccamica Wintoniensi*, which used to be attributed to Christopher Johnson, the headmaster of Winchester about 1560, but which has been shown to have been written about 1650, there is no hint of fagging. The fagging system, which is really nothing more than the conversion of small boys into servants to big boys, is popularly supposed to be connected with and part of the prefect or monitorial system, of the self-government of which so much is said, but which is the government of young boys by elder boys. The prefect system (*q.v.*) can be traced to about the time of William of Wykeham, who in the statutes of Winchester College in 1400 provided that "in each chamber (of twelve boys) there should be at least three scholars of good character more advanced than the rest in age, sense and learning to superintend the studies of their chamber-fellows and diligently correct them and to inform the Warden and Magister Informator of their morals, behaviour, and advancement in learning," so that the defaulters may be duly punished. A similar provision appears for the fellows of New College, and was taken in turn from a similar provision in the statutes of Merton made in 1274. But it will be noticed that while in later days the prefects themselves inflicted punishment, in 1400 and in 1650 the prefects were not magistrates, but police constables; they did not punish offenders themselves, but only reported them to the master, who alone inflicted the penalty. There was of course no necessary connection between this power of reporting and the power of compulsory service. Nor was there scope for it. In fact, in 1650, as in the statutes made by Queen Elizabeth for Westminster School in 1560, all the boys were under one common servitude. At Westminster, "prayers finished they all make their own beds. Then each shall take any dust or dirt there may be under his own bed and carry it to the middle of the chamber, and these shall be swept up into one heap and carried out by four boys appointed by the præpostor." In the same way at St. Paul's, Colet in 1518 provided for a "pore scoler" being appointed to sweep the school, but he was paid for doing so with the admission fee of 4*d.* each paid by new boys. So, too, another "pore childe of the scole," looked after the latrines and had the "avayle of the uryn" for it. This was all in accordance with the usual practice, under which the sons even of lords and earls went as "henchmen" or servants into the household of the king or the chancellor or archbishops and bishops, securing their education at the same time, but waiting at table and performing menial offices for their masters. The Prefect of Tub (*Prefectus ollæ*) at Winchester in like manner had to collect the fragments and crumbs and broken meats in hall and place them in a large tub, which still stands in hall, whence they were distributed to the poor; and he dined with the servants after the others had done. The choristers too, sixteen in number, who did their lessons in school with the rest, and most of whom were afterwards admitted as scholars, — at Eton the choristers of Eton and King's had even a statutory preference for being admitted as scholars, — waited on the scholars. It was not till about 1711 that, at the instance of the Bishop of Winchester as visitor, the scholars were relieved of what he called the foul and servile office of making their own beds, and in 1778 it was ordered that any beer wanted in chambers at proper times was to be carried down by the bed makers and not by any of the boys on any pretense whatsoever. The junior boy at each "end" in hall was, however, to pour out the beer for the rest. Even then the præpostor of the hall was to "accuse" those absent, and not punish them himself.

But from 1775 onward the fagging system was in full swing. It probably came into existence with the organization of games and the practice of extra meals. The hour for going to bed as late as 1650 was eight, and even in 1778 the juniors were ordered to be in bed at half past eight and the prefects at nine. Supper (*merenda*) was provided in hall, and there was no scope for extra meals. There were no organized games much before 1775. Gray's *Ode to Eton* in 1747 speaks of cricket, football, and hoops, but not for matches. A cricket song written by a

Winchester scholar, George Huddesford, in 1769, was not for the school, but for the Hambledon Club, and in another poem written about the same time on Whitsuntide he celebrates cricket as a game played in the summer holidays, which then began in June, not as now at the end of July. It was the organization of games and of meals which produced fagging and caused infinite misery to generations of small boys. To have to prepare sausages and toast for breakfast was no great hardship, but to have to get ready coffee or cocoa or hot beer at night and to clean the pots and pans and cups afterwards; to have to provide hot water for washing, was a real hardship, especially when every breakage was probably punished with a spanking. Mr. Oscar Browning, in his *Reminiscences* (1910), says that it used to be common complaint against small collegers at Eton that they were dirty and untidy, and he asks how they could be otherwise with the tasks they had to perform, with chapped hands cleaning pots and pans, oiling cricket bats, even shining boots. Then in play time, instead of enjoying themselves by themselves, the boys had to long-stop and field at cricket, and to be admonished for mistakes even with a cricket stump; at football to stand about and kick in the ball; at rackets in the open courts of those days, to stand around and field the ball. With a good-tempered prefect or præpostor it was not so bad, but the bad-tempered or the bully certainly predominated, and thus made life a burden to the unhappy junior. Meanwhile, not only the authorized seniors, but unauthorized big boys low down in the school, naturally took to fagging on their own account. *Tom Brown's School Days* shows the quarrels that arose then between the lower and the fifth-form boys as to the right of the latter to fag them, and to kick them if they did not obey. At Eton school 350 boys had the right of fagging the rest. The "old boy" was very fond of bragging about the miseries he endured and the merits of the Spartan discipline, and so forth. It was all very well, looking through the glamour of years. But numbers of boys broke down under the system, many had their spirits crushed, and others had cruelty instilled into them. The same people who advocated flogging in the army and the navy and the hanging of men for stealing 6*s*. 8*d*. in a dwelling house supported unlimited fagging and its accompanying unlimited physical violence. But in all the great schools fagging has, since 1870, now been reduced to a minimum, and the violence accompanying it forbidden. The result is that the small boy now enjoys school life instead of hating it; his learning has increased his strength and spirit are improved and not diminished; and his morals and manners have not suffered, but developed.

A. F. L.

FAIRCHILD, EDWARD HENRY (1815–1889). — College president, graduated at Oberlin College in 1839. For several years he engaged in educational work among the negroes of Ohio. He was a professor in Oberlin College from 1853 to 1869, and president of Berea College from 1869 to 1889. W. S. M.

FAIRCHILD, GEORGE THOMPSON (1838–1901). — College president and apostle of agricultural education, graduated from Oberlin College in 1862. He was professor in the Michigan Agricultural College (1865–1879), president of the Kansas Agricultural College (1879–1897), and vice-president of Berea College (1898–1901). Author of numerous papers on agricultural education and rural problems. W. S. M.

FAIRCHILD, JAMES HARRIS (1817–1902). — An ardent advocate of the higher education of women, graduated at Oberlin College in 1838. He was a professor in that institution for twenty-eight years (1838–1866), and president of the college from 1866 to 1889. His educational writings include *Coeducation of the Sexes* and papers on the education of women. W. S. M.

FAIRMOUNT COLLEGE, WICHITA, KAN. — Opened in 1892 as a preparatory school, and organized as a college in 1895. Academic, collegiate, and music departments are maintained. Candidates to the college are admitted on certificate of an accredited high school or on an examination, the requirements for which are equivalent to fifteen units. There is a faculty of nineteen members.

FAIRY STORIES, VALUE AND PLACE OF IN EDUCATION. — See FOLKLORE; STORY TELLING.

FAIRY TALES. — See FOLKLORE; MYTHS; STORY TELLING.

FALK, JOHANN DANIEL (1760–1826). — The founder of the first German Child-Rescue Institution (*Rettungshaus*); born in Danzig. After leaving school at the age of ten, he was enabled, through the intervention of one of his teachers, to take up his studies again; and in 1791 he entered the University of Halle, where he devoted himself to the study of philology and of the Kantian philosophy. Having become known as an author, chiefly of satirical poems, he moved to Weimar in 1797, where he gained the friendship of Wieland, Herder, and Goethe. In 1813 he founded the "Society of Friends in Need," in order to alleviate the distress into which the country had fallen in consequence of the Napoleonic wars, and undertook the care and education of orphaned and neglected children. The most talented of these were trained by himself, with a view of their becoming helpers in what he called the work of "home mission" (*Innere Mission*). With the aid of his pupils, he personally erected a building in which he could provide for about two hundred children. The children were kept there until they could be apprenticed with artisans; some were even sent to the teachers' seminary or the Latin school; these, in turn, had to instruct the younger children. For girls he instituted a sewing, spinning, and knitting school. After his death the institution was taken over by the State (1829), and it still exists under the name of *Falkisches Institut.*

Falk's pedagogic ideas are eminently sound and practical. The formation of a moral and religious character he considers as the most important aim of education. He emphasizes the necessity of instruction in the mother tongue and its literature, in history, science, and art. The rescue work which he started was taken up on a larger scale by Wichern, who, in 1848, founded the *Innere Mission*, a large organization for evangelical and social effort throughout Germany.

Falk's satirical works were published in 1826 in seven volumes. Of biographical interest are the two books: *Geheimes Tagebuch, oder mein Leben vor Gott* (*Secret Diary, or My Life before God*) (Halle, 1898); and *Goethe aus näherem persönlichen Verkehr dargestellt* (*Goethe described from close personal intercourse* (Leipzig, 1832). His pedagogic ideas are contained in a pamphlet, published in 1821, entitled: *Von dem Einen, was unseren Gymnasien und Volksschulen in ihrem jetzigen Zustand nottut* (*The one thing necessary for our gymnasiums and public schools in their present condition*). F. M.

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FALKLAND, VISCOUNT LUCIUS CARY (1610?–1643). — Statesman and author; of importance in the history of education from his keen sympathy with the Oxford University men, who by discussions on questions connected with philosophy and experimental subjects became the pioneers of the movement which led to the formation of the Royal Society (*q.v.*). The *locus classicus* on the Great Tew group is in Lord Clarendon's *History of the Great Rebellion:* "His [Lord Falkland's] house being within ten miles of Oxford, he contracted familiarity and friendship with the most polite and accurate men of that university; who found such an immenseness of wit, and such a solidity of judgment in him, so infinite a fancy, bound up by a most logical ratiocination, such a vast knowledge, that he was not ignorant in anything, yet such an excessive humility, as if he had known nothing, that they frequently resorted and dwelt with him as in a college, situated in a purer air; so that his house was a university in a less volume, whither they came not so much for repose as study, and to examine and refine those grosser propositions, which laziness and consent made current in vulgar conversation."

Lord Falkland's wife was Lettice (1611–1648), daughter of Sir Richard Morison. After Lord Falkland's death, she gave herself up to private religious devotions; family prayers, singing of psalms, catechizing of children and domestics, visiting of poor neighbors, to whom she would sometimes read religious books while they were employed in spinning. For the poor children she erected a school where they were to be taught both to read and to work. She projected a college for the education of young gentlewomen and for the retirement of widows; to be for women " as colleges and the Inns of Court and Chancery are for men " in several parts of the kingdom, so that learning and religion "might flourish more in her own sex." The distracted times of the great Civil War made it impracticable to carry out the plan, but Lady Falkland deserves a high place as the pioneer of projects for the higher education of women in the first half of the seventeenth century. F. W.

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FALSE POSITION. — A rule that was formerly considered of great importance in the teaching of arithmetic. It is very ancient, having been known to the Egyptians, the Hindus, the Arabs, and the medieval Christians. In the Middle Ages it commonly went by such names as *Regula Falsi, Regula Falsi Positionis, Regula Positionis*, etc., and later as *La Reigle de Faux, Regula Positionum aut Augmenti et Decrementi.* The use of the rule may be seen in the following example from Adam Riese (*q.v.*): "'God greet you 30 children.' Thereupon one of them answers, 'If we were as many again and half as many we would be 30.'" The solution consists in guessing a number (generally a false placing or position, whence the name), as 16. Then, by the conditions,

$$16+16+8=40, \text{ or } 10 \text{ too much.}$$

Try 14; then $14+14+7=35$, or 5 too much. Then write

$$\begin{array}{rl} 14\times 10 = & 140 \\ 16\times 5 = & \underline{80} \\ & 60 \end{array}$$

and $\frac{60}{10-5} = 12$, the answer.

In general, if we have to solve the problem

$ax = b$,
first let $x = m$,
and suppose $am = b - e_1$, e_1 being the first error.
Let $x = n$,
and $an = b - e_2$, e_2 being the second error.
Then $a(x - m) = e_1$,
and $a(x - n) = e_2$,
whence $x = \frac{e_1 n - e_2 m}{e_2 - e_1}$, which is the rule.

The invention of algebraic symbolism rendered such circumlocution unnecessary, and so the rule passed away during the nineteenth century. It was merely a rule for attaining what algebra gives much more easily. There was a distinction made between the rule of single false position and the rule of double false position. The Arabs called the rule by a name which Leonardo of Pisa (see FIBONACCI) gave as *elchataym*. It therefore appears by such names as *El cataym* (Paciuolo, *q.v.*), *per il Cataino* (Cataneo, 1546), *Regole del Cattaino* (Pagani, 1591), and *Regola Helcataym* (Tartaglia, *q.v.*). D. E. S.

FAMILY EDUCATION.—The term "education" has so long been associated with "school" that there is a tendency to forget that the school is but one among many educational agencies, that one whose chief function is formal instruction. (See EDUCATION.) Of all educational institutions the most fundamental is the family. As Rosenkranz says, "The family is the organic starting point of all education." For the first six years of a child's life the family is normally the only educational institution. The family is the undifferentiated whole in which the child receives its first introduction to the social ideas of the larger world — economic, political, and religious. While family education may be regarded as preparatory to the school, it also performs an important function alongside the school. The relations among the members of a family are immediate, direct, and living. It is here that the child first learns the spirit of coöperation and acquires those virtues which lie at the root of social organization — sympathy, affection, gratitude, respect, obedience, and negation of the self. It must be recognized, however, that changing economic conditions have weakened family influences, and the tendency has been not to foster education in the home so much as to throw the burden on the teacher and the school.

In primitive society the child is early initiated into the struggle for existence, first through imitation of the occupations of his elders, and then by direct participation. Under the care of the father and the grandfather the boy learns to shoot, hunt, and fish; while under the care of the mother and grandmother the girl is taught the elements of household economy, industrial art, and agriculture. Under the same guidance follows adjustment to all the customs of the tribe and to the ceremonials due to the world of spirits. (See PRIMITIVE SOCIETY, EDUCATION IN.) In the early period of Hebrew and Roman history and among the Chinese (*qq.v.*) the family type of education is dominant. The primary aims are the inculcation of filial piety, loyalty to the members of the family living and dead, and self-control, — the subordination of the individual to the interests of the group. The Greek subordination of family to civic life finds its extreme statement in Plato's theory of the communistic nurture of children.

The modern conception of state control in education is the outgrowth of the Reformation, and is the result of reaction against ecclesiastical domination and of the recognition of the responsibility of the State with respect to the education of its citizens. Just as all our modern industries have been derived by a process of differentiation and specialization from the organized occupations carried on in the family, so likewise are the modern schools the product of specialization. First the Church and then the State assumed control of education. The first stage of state interference was to hold parents and masters responsible for the education of their children and apprentices, and this was done by compulsory examination and supervision. The best examples of this process are the Massachusetts law of 1642 and the Connecticut Code of 1650. (See COLONIAL PERIOD IN AMERICAN EDUCATION.)

But with the development of social consciousness, and the economic pressure which on the one hand led to congested city life and on the other tended to remove both parents from the home for the greater part of the day, the State stepped in and supplemented the efforts of the family. Compulsory school attendance (*q.v.*), free schools, kindergartens (*q.v.*), day nurseries or crèches, the feeding of school children (*q.v.*), and medical inspection (*q.v.*) are measures of state interference which not only benefit the State, but improve the possibility of healthy family life. It is objected that such measures free the family from responsibilities for which it naturally stands. To this it may be replied not only that the needs of society and humanity are above those of the family, but that such measures are educational and transitional. The same may be said of the introduction of school and district nurses, of visiting teachers, and of parents' or mothers' meetings. The vocational preparation of children has long been abandoned by the family, owing to the complexities of modern economic organization; but in this field the State can improve conditions of life by undertaking such training. Direct preparation for the duties of parenthood and family life is seen in the introduction of such subjects as care of infants, cooking, and the whole round of household arts. And though the extension of school activities may in many cases afford parents the opportunity to shirk their natural duties, yet the limitation of the school would not necessarily result in the strengthening of the educational influence of the family. To increase the efficiency of education through the family it is of prime necessity to secure improved conditions in the home and to supplement its deficiencies. Toward this end the economic and educational movements of the most progressive countries are at present directed in the following forms: —

1. Improved conditions for the home are provided by the various measures to relieve the congestion in the city by the erection of municipal and model dwellings, by cheap transportation, and by the various means taken to render more attractive the life of suburban and country communities.

2. The health and welfare of the child is essential to complete family life. If the wages of the young child are needed for the home, or if the parents are unable to provide for the necessary medical attention, and the family life consists in mere struggle for existence, progress becomes impossible, and it becomes necessary for the State to aid the parent in prolonging the period of infancy, which has been shown to be so essential in the formation of higher civilization. As communities realize the need of such aid, they undertake the feeding of school children, medical inspection, school clinics, special schools and classes for the defective children, etc.

3. Measures must be taken for the preservation of the family. In order that there may be family life, the wages of the adult members must be sufficient to support the family group. There must be leisure for the social life of the home, and wage earners, especially the mother, must be protected from hazardous and degrading employment. The period of productiveness must be extended; care of the aged must not exhaust the resources which are necessary for the young; finally, the family group must be preserved, even when deprived of the chief wage earner. As a means, therefore, toward the conservation of the home the following measures are now generally demanded: (*a*) limitation of the hours of labor; (*b*) restriction in the employment of young children (see CHILD LABOR; CHILDHOOD, LEGISLATION FOR THE CONSERVATION AND PROTECTION OF); (*c*) liability of employer in case of accident; (*d*) compulsory insurance; (*e*) old age pensions; (*f*) special aid to widows with children.

Inadequacy of the School as an Educational Agency. — The school is inadequate for the following reasons. (1) It occupies less than one-eighth of the child's time during only a limited period of life. It is not sufficient to overcome neglect of the home or the evil influence of the street. It is too brief a time for the establishment of good habits of thought, speech, and behavior. (2) The school lacks continuity of social influence. The child is passed along from group to group once a year, and often at shorter intervals, with frequent changes of teachers, and has but little opportunity to develop a feeling of social solidarity or responsibility. The entire plan of the school is artificial from the standpoint of social organization. All attempts at overcoming these disadvantages, in the various plans of school cities and other forms of self-government, have thus far only tended to further accentuate this artificiality. (3) As the school is organized for the purpose of the instruction of pupils of similar attainments, group conformity is the chief virtue; while in the home we have a group of people of different ages and attainments working in coöperation, each fulfilling a different function. Here is afforded opportunity for self-reliance and individuality. (4) The school is subjective rather than objective, egoistic rather than altruistic; even in the case of various forms of manual training, whatever is produced is for the sake of instructing the child and does not usually represent the child's contribution for the interest of others.

The Child in the Home. — The emperor, Marcus Aurelius, thanked the gods that he had the satisfaction of his mother's life and company a considerable while, though she was destined to die young. The care and early training of the infant is the special province of the mother as nurse and guide, whatever theory may be held as to the relation of the home and the school in the education of the child. Comenius, to whom we owe the modern system of school grading, called the first six years the mother's school, and found in this the elements of all later education, — intellectual, moral, and religious; even the rudiments of natural science and philosophy. According to Rousseau, as the real nurse is the mother, the real preceptor is the father; and in order to justify the employment of a tutor to fulfill the duty which naturally belonged to the father, Rousseau found it necessary to imagine Émile an orphan. Pestalozzi began his educational career by taking into his own home a number of neglected children and treating them as members of his own family. According to his idea of education as pictured in *Leonard and Gertrude*, the true teacher is the mother who keeps her children occupied in household duties, and at the same time instructs them in the arts of reading, writing, and arithmetic. Pestalozzi's principle was that it is life which educates; and that the moral, intellectual, and industrial center of elementary education must be found in the sympathy, ideas, speech, and intelligent activities of a well-organized family life. Froebel completed the thought of Pestalozzi. He taught that only in the family is real experience to be found; only as a member of the family will it be possible for man to become a symmetrical, real, whole man; only in the family is there complete provision for the fundamental need of childhood, — self-expression (*Education of Man*, pages 101–102). The primary purpose of early home training should be the establishment of good habits and the practice of obedience. The young child should be permitted peace and quiet; many of his faults should be ignored; the standards and opinions of elders should not be enforced upon him, but his own personality should be preserved. The child must, however, adjust himself to the habits of the household and feel his responsibility as a member of the family circle. The child should not expect to be entertained, but should be given simple toys which afford opportunity for initiative. Love of nature should be cultivated by calling attention to flowers, trees, birds, etc., during walks. Through story telling and reading aloud an interest in literature may be aroused and the desire to read stimulated.

The moral and social influences of the home present the following characteristics: " Service from sympathy, service without a sense of patronage or humiliation, and service as the expression of each emotion," which, " together constitute the ideal which should inspire the relations of the man to his fellow-creatures" (Bray, *The Town Child*).

Home and School. — When school age is reached, the duty of the parent with respect to education cannot be fiulfilled by sending the child to school. " Those parents," says Plutarch, "are to be blamed who, when they have committed their sons to the care of pedagogues or schoolmasters, never see or hear them perform their tasks; wherein they fail much of their duty. For they ought, ever and anon, after the intermission of some days, to make trial of their children's proficiency; and not entrust their hopes of them to the discretion of a hireling. For even that sort of men will take more care of the children, when they know that they are regularly to be called to account. And here the saying of the king's groom is very applicable, 'that nothing made the horse so fat as the king's eye.' " There must be unity of aim and coöperation in method on the part of the most important educational institutions, home and school. To further this coöperation, visits of parents to the school and of teachers to the homes are becoming general. In New York the experiment is being tried of employing additional visiting teachers whose sole duty is to secure a helpful relation between the home and the school. Parents' associations are frequently the outgrowth of mothers' meetings, an established feature of the kindergarten. Through such meetings and associations parents receive suggestions as to home care of children and keep in touch with school aims and methods. The Parents' National Educational Union (*q.v.*) of England has for its aim the enlightenment of parents with respect to instruction and training at home or in private schools. Definite courses of study are prepared under the auspices of the Union.

True coöperation of the home and school, however, cannot be brought about by the subordination of the home; by making the home, as is so often the case, merely a preparation for school. Instead of hearing spelling lessons, parents should read with their children the great classics which appeal alike to young and old. Instead of having school tasks to upset the home, the home should possess its own duties and pleasures. " What is required above all," says Ellen Key, " for the children of the present day, is to be assigned again real home occupations, tasks they must do conscientiously, habits of work arranged for week days and holidays without oversight, in every case where the child can help himself." " The strongest constructive factor in the education of a human being is the settled, quiet order of home, its peace, and its duty. . . . The house once more becomes a home for the souls of children, not for their bodies alone. For such homes to be formed, that in their turn will mold children, the children must be given back the home. Instead of the study preparation at home for the school taking up, as it now does, the best part of a child's life, the school must get the smaller part, the home the larger part. The home will have the responsibility of so using the free time, as well on ordinary days as on holidays, that the children will really become a part of the home both in their work and in their pleasures. The children will be taken from the school, the street, the factory, and restored to the home. The mother will be given back from work outside, or from social life, to the children. Thus natural training in the spirit of Rousseau and Spencer will be realized: a training for life, by life at home."

The Social Significance of Family Education. — Not wholly without reason, it has become customary to regard the school as the most important means of controlling the future. Specific instruction in the schools is demanded, that temperance, thrift, chastity, and civic duty may form the ideals and the practice of the rising generation. Too much is expected of the school alone. According to Professor Giddings, "There is no radical cure for degeneration but in a pure and sane family life, which disciplines the welcome and untainted child in the robust virtue of self-control, and in an unswerving allegiance to duty." J. F. R.

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FANCY. — A term employed to designate those forms of mental activity in which the individual builds up combinations of experience without serious reference to the correspondence between these forms of experience and any objective reality. Thus one may build up in his fancy the notions of animals or buildings which could not be realized in any external experience. Fancy is one phase of imagination (*q.v.*).

C. H. J.

FARADAY, MICHAEL (1791–1867). — Famous English scientist, born of humble parentage at Newington Butts, Surrey. After a brief education in the elementary subjects, he became in 1804 errand boy, then apprentice, to a stationer and bookbinder. He took an interest in books, particularly those bearing on scientific topics. In his spare hours he dabbled in chemistry and electricity. In 1812 an opportunity offered of attending some lectures by Sir Humphry Davy, the notes of which Faraday carefully copied out and bound. In 1813, becoming tired of business pursuits, he offered his services to Davy, who obtained for him the position of laboratory assistant in the Royal Institution. After a period of nearly two years spent in travel with Sir Humphry, during which he came into contact with the most prominent scientists of the day, he renewed his work at the Royal Institution, with which he remained intimately connected until his death. Stimulated by an ambition to become a lecturer, he began to take a prominent part in the proceedings of the City Philosophical Club, consisting of young enthusiasts like himself, took lessons in elocution, and studied the methods of the prominent scientists who lectured at the Institution. Until 1821 he assisted Davy in his researches, but about that period he began to make original researches on his own account. Beginning with his discovery of electromagnetic rotations in 1821, he was able in 1831 to perfect his work on magnetoelectricity and induction, which laid the basis for future improvements in the applications of electricity. His researches were also conducted in chemistry, and in this field he discovered new compounds which later made possible the use of aniline dyes. His published works, including articles and reports, are *Experimental Researches in Electricity* (1839–1855), and *Researches in Chemistry and Physics* (1859). As early as 1823 he was elected a Fellow of the Royal Society, and he became a contributor to the chief scientific reviews. From 1823 to 1862 Faraday lectured regularly at the Royal Institution, with the exception of the four years 1840–1844, when through ill health he was compelled to cease work; but even in this period he did not discontinue his Christmas lectures to juveniles, which commenced in 1827 and always continued to give him pleasure. Offers of promotion and advancement were persistently refused in order to be able to give more time to researches. Because it did not make much demand on his time, he consented to lecture at Woolwich Academy (1829–1849). In 1836 he became adviser to Trinity House, which has charge of lighthouses. He was without a rival as a lecturer, not only because he was deeply inspired with the meaning of his subject, but also because he studied himself with the purpose of acquiring perfection on the platform. And as an experimenter he stands in the forefront of scientists. Honors continued to be showered upon him, but of all he valued most his fellowship in the Royal Society and his place on the Senate of the University of London. In the last position he was able to make some recommendations on examinations for scientific degrees, holding that neither a written nor an oral test was adequate; and at Woolwich he gave instructions that the students' notebooks should be examined.

In his opinions on education Faraday did not rise above the prevailing disciplinary views, except that he ranged himself on the side of sciences as against the classics, although in a remarkable lecture on the *Education of the Judgment*, delivered in 1854 in the presence of the Prince Consort, he began with the statement that " Education includes all that belongs to the improvement of the mind." The theme of this essay was the deficiency of judgment in the exercise of the mental powers. Men, he says, are willing to rely on the senses alone, without further examination, while the best basis for judgment includes not only carefully observed facts, but the laws of nature. Hence education must be of the self; self-examination, self-criticism, sincerity, recognition of ignorance, and readiness to accept correction, — these are the marks of true education and mental discipline. There is in us too strong a tendency to discover what we wish to discover. Clear and precise ideas, and clear and definite language are necessary if the sense and love of truth are to be attained. Comparison, balance of data, proportionate judgment, suspense of judgment are all steps in the process of reaching truth. Book-learning Faraday distinguished from the exercise of judgment which can be improved and trained in any field by mental labor. In urging the cultivation of the scientific spirit Faraday makes constant reference to the unscientific acceptance by his own contemporaries of table-tipping and other devices of spiritualism. The lecture, however, is one that can be read in any generation.

Faraday was one of the witnesses examined by the Public Schools Commission in 1862. He deprecated the claims made by the supporters of classics and pure mathematics for the mental discipline imparted by these subjects, citing examples within his own experience of men highly educated in the accepted sense of the term who had acquired such habits of mind that in relation to natural phenomena they had to begin at the same point as children, and must learn the A B C of things. The old training was also the cause of a supercilious attitude toward the new knowledge as nonsense. While not attacking classics, he insisted at any rate that they were not the whole of knowledge, and so far as the transfer of powers through a classical training is concerned, he says, "Society at large is almost ignorant of the like and greater value of the kind of study which I recommend." While Faraday's influence on education was not positive, he belonged to that group of scientists of the middle of the nineteenth century who indirectly affected the schools through the social recognition which they won by their eminence in the new field.

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FARGO COLLEGE, FARGO, N.D. — A coeducational institution, founded in 1887 by the Congregational churches of North Dakota, but now undenominational. Preparatory, collegiate, and music and art departments are maintained. Candidates are admitted on certificates from high schools and on examination, the requirements for which are equivalent to fifteen units of preparatory work. There is a faculty of thirty members.

FARNABY, THOMAS (1575–1647). — Possibly the greatest English private schoolmaster of the seventeenth century. Anthony à Wood describes him as the chief grammarian, rhetorician (Latin), poet, Latinist, and Grecian of his time. Born the son of a London carpenter about 1575, Farnaby in 1590 entered Merton College, Oxford, where he was postmaster to Mr. Thomas French. He left the college abruptly. After a roving life as sailor and soldier, he returned to England and settled at Martock, Somersetshire, where he "stooped so low as to be an abcdarian, and several were taught their hornbooks by him, and in the neighborhood of Martock were found in later years those who had been his old pupils, who had become good grammarians." Farnaby, on leaving Martock, opened a school in Goldsmiths' Rents in Cripplegate, London, and is reported to have worked up his private school there to the number of "three hundred or more, including many young noblemen and other generous youth." He is said to have had separate rooms for the different forms, and three ushers, one of whom was young Alexander Gill (*q.v.*), whose father was the head of St. Paul's School. Another usher was William Burton, the antiquary. An interesting account of Farnaby's method of dealing with a pupil is seen in the "Autobiography of Sir John Bramston" (*Camden Society Reprints*, page 101). Farnaby removed his school, in 1636, to Sevenoaks in Kent. He became rich, and was probably the first English schoolmaster who made a fortune. In the great Civil War he took the king's side, and was arrested by the Parliamentarians at Tonbridge in 1643, and imprisoned at Newgate. In 1645 he was allowed to return to Sevenoaks, where he died in 1647.

Farnaby edited the following classics: *Juvenalis et Persii Saturae*, 1612; *Senecae Tragoediae*, 1613; *Lucani Pharsalia*, 1618; *Martialis Epigrammata*, 1615; *Vergilii Opera*, 1634; *Ovidi Metamorphoses*, 1637; *Terentii Comoediae*, 1651. Many of these went through numerous editions, and were well known on the Continent. In addition, Farnaby also issued several schoolbooks, including the following: *Phrases oratoriae elegantiores et poeticae*, London, 1628, 8th edition mentioned by Wood; *Index Rhetoricus, scholis et institutioni tenerioris aetatis accommodatus, cui adjiciuntur Formulae Oratoriae*, 1633; *Systema Grammaticum*, 1641; this grammar was written by royal order and was specially authorized; *Florilegium epigrammatum Graecorum, eorumque Latino versu a variis redditorum;* 1629; this *Florilegium* of Greek epigrams is of course the Greek anthology collected by Maximus Planudes. Farnaby collected the translations of the Greek into Latin verse by Sir Thomas More, H. Stephens, Erasmus, Lily, Alciat, Scaliger, Buchanan, etc., and supplied some himself. Of these books, the *Index Rhetoricus* ran through the greatest number of editions. The earlier parts of Farnaby's *Index Rhetoricus* are occupied with an account of rhetorical treatment of matter and form in any composition, oral or verbal. In this system, great stress is laid on oratory, for a composition should be elegant, and it should be dignified: and, above all, the composition must be *apt*. F. W.

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FARNHAM, GEORGE LOOMIS (1824–1900). — Advocate of the sentence method in teaching reading; was educated in the common schools of New York and at the Albany Normal School under David P. Page (*q.v.*). He was principal and superintendent of schools at Syracuse; superintendent of schools at Binghampton, N.Y., and Council Bluffs, Iowa. From 1884 to 1893 he was principal of the Nebraska Normal School at Peru. Author of *The Sentence Method of Teaching Read-*

ing (Syracuse, 1887), and of several papers and addresses on the same subject. W. S. M.

See Reading, Methods of Teaching.

FARRAR, FREDERICK WILLIAM (1831–1903). — English schoolmaster, author and clergyman; born in Bombay in 1831. He graduated at Trinity College, Cambridge, where in 1856 he was elected to a fellowship. He entered holy orders and received an appointment as assistant master at Harrow. In 1871 he became Headmaster of Marlborough College, where he was successful in raising the school from the decline into which it had temporarily fallen. In 1876 he became Canon of Westminster, and in 1890 Dean of Canterbury. Farrar was a prolific writer on theology, education, and history, and was the author of some stories which for many years enjoyed a remarkable vogue. Among these are the school tales, *Eric, or Little by Little; A Tale of Roslyn School; St. Winifred's, or the World of School;* and *Julian Home*, all to some extent autobiographical. A book of a different kind and perhaps even more widely read was his *Life of Christ*. Dean Farrar played a very important part in the movement of the reform of the curriculum, and in introducing generally the so-called modern subjects. In 1867 and 1868 he lectured at the Royal Institution on *Public School Reform*, when he attacked the traditional classical education and pleaded for the broadening of the curriculum. To the *Essays on a Liberal Education* (London, 1867), which he edited, he contributed an article on *Greek and Latin Verse Composition as a general Branch of Education*, a plea for a much broader course of studies than the classical. Another contribution to education was the lecture on *General Aims of the Teacher*, delivered at Cambridge in 1883, containing advice and suggestions to teachers culled from his own experience. While Farrar did not possess the administrative ability to carry his suggested reforms into effect, there is no doubt but that the weight of his influence contributed greatly to the changes which came into the English schools in the last quarter of the nineteenth century.

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FARRAR, JOHN (1779–1853). — Textbook author; graduated at Harvard College in 1804, where he was an instructor and professor for thirty-one years. He was the author of twelve schoolbooks on mathematics. W. S. M.

FATHERS OF THE CHURCH. — See Christian Education in the Early Church; and the special articles on the various fathers.

FATIGUE. — A condition of the organism characterized objectively by a reduction of efficiency, and subjectively by a complex of feeling and sensation (particularly the feeling of weariness and sensations of strain and fatigue, mainly peripheral in origin), by a disinclination to exert effort, and ultimately by a desire to sleep. We speak of physical or of mental fatigue, according as the functional inefficiency appears in physical or in mental work, and we speak of fatigue by bodily activity or of fatigue by mental activity, according as the activity that induced the functional inefficiency was physical or mental. Both in investigating fatigue experimentally and in applying the results of investigation in practice, we must distinguish between these subjective and these objective aspects, since we find that there is no thoroughgoing uniformity in their interrelations: in particular, many individuals can do work that is objectively satisfactory, when they experience all the subjective symptoms of fatigue. To what extent we are warranted in encouraging children to exert effort under these circumstances is another matter. In general, the subjective symptoms may be regarded as protective devices, as warnings that work should give way to rest. Exhaustion is an extreme form of fatigue, in which functioning is, as a rule, not only inefficient, but also disordered — in which, then, fatigue has passed into a pathological condition. Overburdening or overloading are terms applied, in educational parlance, to a condition in which the demands made upon the pupil are excessive, with the result that the ordinary processes of sleep and nutrition do not suffice to remove the fatigue from day to day, and that the fatigue effects are cumulative, and lead ultimately to neurasthenia, general debility, or some other form of general breakdown.

The older theories of fatigue, of which Verworn's is typical, envisaged the condition with relative simplicity in chemical terms. Negatively, fatigue represents a consumption of materials, especially of oxygen, carbon, and sodium; positively, it represents a production and accumulation of waste products of metabolism, especially of lactic acid and acid potassium phosphate, the "fatigue substances" or "fatigue poisons." Weichardt has recently claimed the discovery of special antitoxins formed within the organism in reaction to the fatigue toxins. Injection of these antitoxins affords temporary immunity to fatigue, in the case at least of the small animals experimented upon.

While this chemico-physiological theory may be adequate to explain simple examples of fatigue, *e.g.* in the stock nerve-muscle experiment of the physiologist, it is inadequate (despite Lee's ingenious extension of the Treppe theory to mental work) to the vastly more complex conditions that govern mental fatigue in the human organism. Recent theories of fatigue (*e.g.* Yoakum, MacDougall) show a tendency to follow Sherrington and other physiologists in envisaging neuromuscular activity in terms of the " reflex-arc concept," and to utilize especially the idea of the " resistance " or " blocking " of nerve paths at the synapses of the neurones. These are, as yet, however, but speculative hypotheses. The course of mental efficiency, as is shown below, is complicated by numerous psychological factors, the reduction of which to physiological terms is certainly difficult, and perhaps of little practical advantage.

Another important theoretical problem concerns the question whether fatigue is general or specific (local). It is important, because, if fatigue set up in a specific structure is rapidly disseminated through the organism by the circulation of the blood, we may hope to measure fatigue indirectly; we may hope, for instance, to measure the fatigue of a school hour by its effect on muscular endurance as revealed by the ergograph. Again, if fatigue is essentially specific, then change of work would be an important device for ensuring maximal net efficiency. The truth appears to be that fatigue is both specific and general: when it first appears, and when it is mild, it is, in the main, localized in the active structures; but there is no strict isolation of the fatigue effects, both because the active structures disseminate their waste products through the entire organism, and probably, too, draw upon other structures for a supply of energy, and also because our psychophysical activity is not really as specific as it seems. In effortful thinking, for example, muscles in various parts of the body are under strain; we may feel tired in the back of the neck from the solving of problems in mental arithmetic.

Measurement of Fatigue. — In theory, this may be directed either to the subjective or to the objective aspects. As already noted, the former are too unreliable to serve as indexes of the reduction in efficiency, besides being intrinsically difficult of measurement. The objective aspects may be measured either by physiological or by psychological methods.

1. In tests of school children, the *physiological method* has included the use of the dynamometer (chiefly for measuring strength of grip) and of the ergograph (*q.v.*) (for measuring physical endurance, *e.g.* in voluntary contraction of the finger), the recording of pulse and respiration, of the speed of voluntary movement (tapping test, as in the work of Wells), and of the range of accommodation of the eye (Baur). Pulse and respiration prove to be too much subject to fluctuation from other causes; tapping and accommodation, while of much theoretical interest, have not yet been sufficiently tried out to warrant generalization; the ergograph has, however, been the object of extensive critical investigation, the net result of which is to show that, while the instrument may be adapted for measuring general physical efficiency (for certain individuals and under exact experimental control), there is no definite and reliable correspondence between the ergographic record and the mental efficiency of the pupil that would warrant the general use of the method for measuring fatigue in the school.

2. The *psychological method* embraces two main types of procedure, the method of discrete tests and the method of continuous work. The principal mental tests that have been applied to the measurement of mental fatigue are copying (Schuyten), dictation (Sikorski, Friedrich), computation (Burgerstein, Laser, *et al.*), rote memory (Ebbinghaus, Netschajeff, Schuyten), cancellation (Bourdon, Ritter, Binet), the Ebbinghaus completion test, the combination method of Teljatnik, the pattern tapping test of Squire and Yoakum, together with the estimation of time intervals (Lobsien) and the determination of various liminal values, *e.g.* sensitivity to pain (Vannod, Swift, Claparède), and the discrimination of two tactual stimuli. Of these tests, the last-named, commonly known as the compass-point or æsthesiometric test, or as the Griesbach method (see ÆSTHESIOMETER), has called forth the most discussion. The value of the method has been upheld by Blazek, Keller, Vannod, Wagner, Heller, Bonoff, Ferrari, Sakaki, Schuyten, Joteyko, Abelson, and others; it has been assailed by T. L. Bolton, Kraepelin, Leuba, Germann, Ritter, Gineff, and Meumann. All in all, though subject to obvious defects, some of which may be remedied and others not, these psychological methods, as applied in discrete tests, have yielded useful average values and have afforded valuable information as to the effect and degree of fatigue. Their chief defect lies in the fact that when applied as bits of test work, inserted into the course of other fatiguing work, they do not permit us to follow the development of fatigue step by step.

3. In the *method of continuous work*, as exploited particularly by Kraepelin and his pupils, and as applied generally in laboratory experimentation, the test work itself constitutes the fatiguing work, and is, therefore, continued uninterruptedly for relatively long periods, say for an hour or for several hours. Examples of this method are the computation tests of Burgerstein, Holmes, Thorndike, Kraepelin, *et al.*, the test with Latin verbs of Merian-Genast, the dictation tests of Höpfner. One of the chief contributions of this method is the demonstration that the course of mental efficiency in long-continued work is conditioned, not only by fatigue, but also by several other factors, notably by practice, habituation, " warming-up," " swing," or fitness for work, and by various types of " spurt," — possibly also by yet other independent fluctuations of psychophysical efficiency. To measure fatigue,

therefore, we must disentangle it from these concomitant factors.

Results. — The net outcome of these experimental investigations is the establishment of a number of fairly well-defined laws of fatigue. Much remains to be done, but we know that individuals fall into four fairly distinct types of fatiguability; that fatiguability is a function of age; that sixty minutes is too long a lesson period for the average school child; that the forenoon are more favorable than the afternoon hours; that formal school work should not exceed five hours per day or twenty-five hours per week; that home work should be reduced to the minimum and arranged so that it will not exact intensive application; that short pauses, when filled with free play out of doors, but not with gymnastics, are invaluable offsets of fatigue; that the pauses should increase in frequency and in length as the work continues; that a pause, even of short duration, may work disadvantageously when it interrupts easy work of relatively long duration; that the noon intermission often fails to fulfill its desired recuperative effect because afternoon work begins before digestion is sufficiently advanced; that pupils should obtain from nine to eleven hours of sound sleep; — a desideratum all too frequently unfulfilled — that adequate sleep is the best protection against overburdening; that a change of work does not add positively to the store of energy, but may operate advantageously by setting aside ennui; that exercise, especially in the form of free play, consumes energy, yet is of benefit because it stimulates metabolism and accelerates the removal of waste products; that gymnastics constitute a positive source of fatigue for many pupils; that the fatiguability of school work is partly a function of the subject, partly of the method of instruction, and partly of the teacher; that individual instruction is more fatiguing than class instruction; that the school program should be planned to bring the hard subjects early, to alternate hard and easy work, and to insert frequent and progressively longer pauses.

Questions of practical interest. — Two important questions arise: Is our present school work calculated to produce overburdening? Is it permissible that pupils should work after they show signs of fatigue? For the first query, the evidence appears conclusive that in this country, however it may be in Germany, where the topic has been most under discussion, the regular work of the school does not lead to overburdening in the case of the average healthy pupil. As for the second query, nearly all authorities agree that, while we must not permit fatigue to be carried to exhaustion, with consequent slow or perhaps permanently incomplete recovery, we need not worry because children show signs of weariness, provided the conditions are hygienic as regards air supply, temperature, humidity, methods of work, and the like. Teachers must learn to distinguish between pseudo-fatigue and real fatigue. They must remember that a cardinal element in mental training is the development of a capacity in some measure to disregard the feeling of weariness and to stand up under the pressure of fatigue. But the preaching of this gospel of work carries with it the obligation to teach children how to economize their time and strength, how to study efficiently, how to work to best advantage. The practical problem of fatigue is, in other words, how best to utilize and to conserve human energy. G. M. W.

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FAVILLE, ORAN (1817–1872). — A leader in the organization of the school system of Iowa; was graduated from Wesleyan University in 1844. He was instructor in the Cazenovia and Troy seminaries (1844–1854); professor in McKendree (Ill.) College (1854–1857); active in public school work in Iowa (1857–1863), and superintendent of public instruction in Iowa (1863–1867). Editor of the *Iowa School Journal* (1863–1867). W. S. M.

See Iowa, State of.

FAVORITISM BY TEACHER. — See School Management.

FAWCETT, HENRY (1833-1884). — English statesman and economist, born at Salisbury. One of the schools which he attended was Queenwood College, an agricultural school established by Mr. George Edmondson somewhat on the lines of Fellenberg's school at Hofwyl. Here Fawcett may have acquired that lifelong interest which he showed in agricultural questions. After attending King's College School in London he proceeded to Cambridge, graduating in the mathematical tripos in 1856, and obtaining a fellowship at Trinity Hall. An accident deprived him of his sight, and diverted him from a career at the bar. He turned his attention to economics, contributed papers to the British Association (1859), and wrote a *Manual of Political Economy* (1863). He was a friend and disciple of John Stuart Mill (*q.v.*). In 1863 he was appointed Professor of Political Economy at Cambridge, and held the position till his death. About this time he devoted himself to politics and entered Parliament in 1865, and with a brief interval remained a member of the House of Commons until his death, rising to the position of Postmaster-General, an office in which he showed great efficiency. He was prominent in Parliament in all questions affecting social welfare and education, and himself declared in a speech, " I started political life caring more about the general education of the people than about any other question that is likely to be discussed in this House." While a member of the Cambridge Union he had opened debates on national education and university reform. He was a strong supporter of the movement to abolish tests for degrees and fellowships at the universities of Oxford, Cambridge, and Dublin. The official government measures for University Reform (1871) he opposed on the grounds that the clerical fellowships and tests in college statutes were not removed. In the universities he desired to see the culmination of a national system of education. He criticized keenly the Education Act of 1870 because the establishment of compulsory education was not made mandatory on local authorities, and he kept up his opposition to " permissive compulsion " until 1880, when compulsory education became imperative. To the agitation for free schools he was opposed on the grounds that, while in establishing compulsory education the State acted as the protector of the young, there was no more reason for making education gratuitous than for the State to provide food and clothing to children. Free schools would reduce the interest of parents in education, and would pauperize; all parents should make a sacrifice for the education of their children, or else receive poor relief and so be stigmatized as paupers. In any case he argued free education merely shifted the burdens, and school support would be indirect. On the question of religious education Fawcett would have preferred to see a system of secular education, and one of the reasons for his breach with the Birmingham League was that it was stirring up " a miserable sectarian squabble." Fawcett was also the spokesman for an extension of the educational provisions to agricultural laborers, whose helplessness was largely due to ignorance. Irish university reform claimed a large share of his attention, as well as the growing demand for the higher education of women, a movement in which his wife, Millicent Garret Fawcett, took a prominent part. Fawcett claimed equal opportunities for the education of women, because he was opposed to restrictions of all kinds, and supported the proposal that women should be admitted to the Cambridge local examinations.

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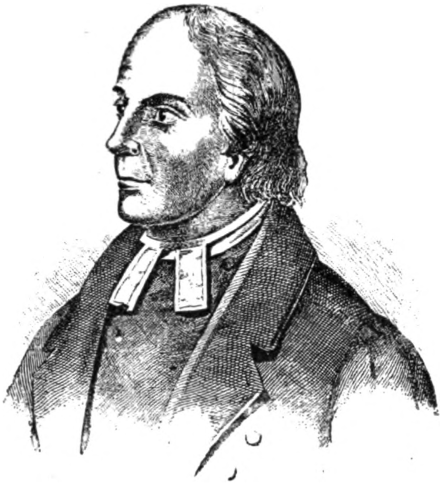
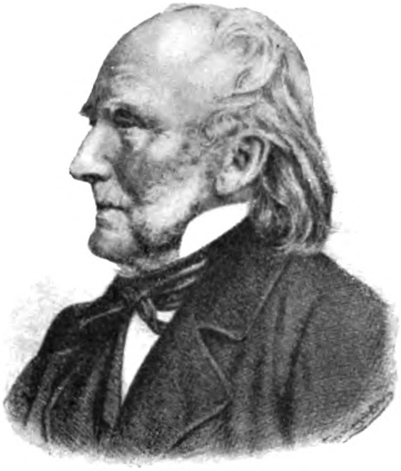
FEAR. — An instinctive recoil from objects that are strange or large or in rapid motion toward one. It is a type of negative reaction. It is protective in its character, and common to all animal forms. C. H. J.

See EMOTIONS; INSTINCT.

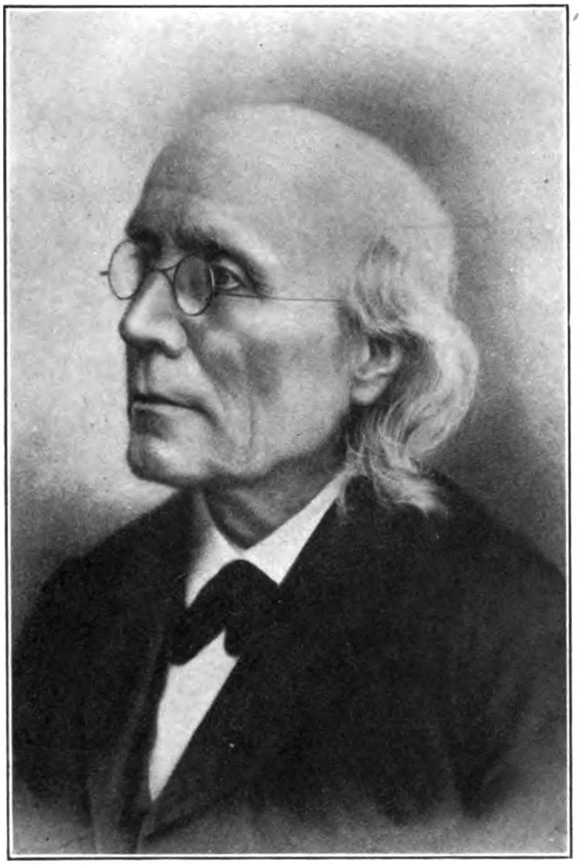
FECHNER, GUSTAV THEODOR (1801-1887). — Student of medicine, physicist, philosopher, and founder of psychophysics and quantitative experimental psychology. He embodied a " happy combination of observation and philosophical speculation." He was professor of physics, and later professor of philosophy, in the University of Leipzig. During a period of forty years he made valuable contributions in various fields. He wrote about seventy-five books and articles in the field of physics, mathematics, electricity, physical optics, religion, evolution, æsthetics, ethics, metaphysics, psychology, and psychophysics. He believed in a universal animism; plants, animals, and celestial bodies alike possess souls. He applied the principle of the conservation of energy to the physiological phenomena accompanying consciousness, and gave fifty of his best years to the investigation of the exact relation between the mental and the physical — between the intensity of sensation and the intensity of the stimulus. These researches — notable examples of caution, patience, and erudition — appear in his epoch-making work, *Elemente der Psychophysik.* In this work he collected many scattered observations from physics, astronomy, and biology; gave the results of his own elaborate investigations in the field of tactual, visual, and auditory sensations; offered sundry philosophical generalizations; and formulated the first great uniformity experimentally es-



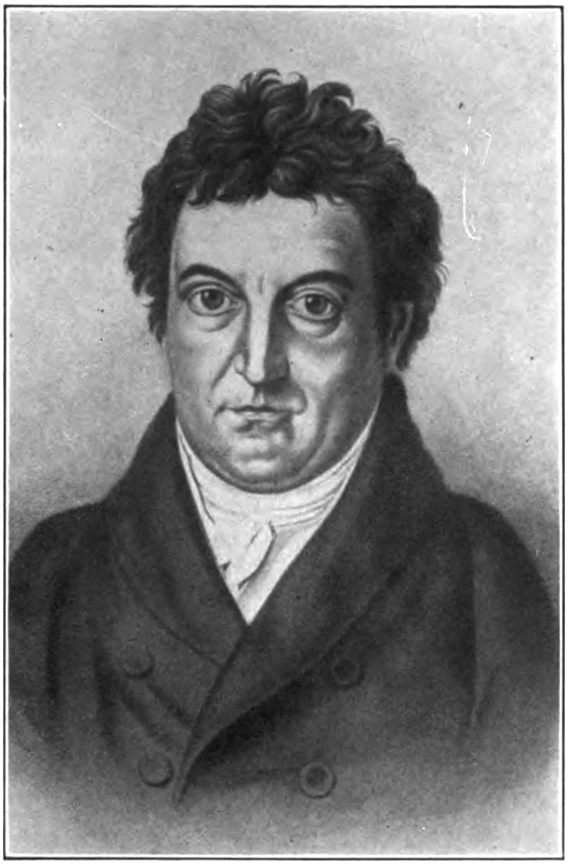
Gustav Friedrich Dinter (1760–1831).
See p. 331.



Friedrich Adolph Wilhelm Diesterweg (1799–1866).
See p. 328.



Gustav Theodor Fechner (1801–1887).
See p. 582.



Johann Gottlieb Fichte (1762–1804).
See p. 605.

A GROUP OF GERMAN EDUCATORS AND PHILOSOPHERS.

tablished in psychology, the so-called Weber, or Weber-Fechner law. This law — that the intensity of the sensation varies as the logarithm of the stimulus — assumed in psychology the importance ascribed to the law of gravity in physics, and raised psychology to the dignity of a science.

Fechner was a man of most varied attainments, but his fame rests chiefly on his psychophysical researches. His psychophysical law, whatever its value, inspired numerous attempts at verification, further investigations, and a sea of critical articles. These works produced a healthy reflex influence upon the development of scientific psychology. If Fechner had not lifted a couple of weights to determine the differential limen, experimental psychology would be quite different from the science as we know it to-day. While Fechner's relation to education is indirect, it is none the less important. Without Fechner there would have been no psychophysics, or at least its development would have been much retarded; without Fechner's psychophysics there would have been no exact quantitative psychology, or its appearance would have been delayed; and without modern experimental psychology the scientific study of educational problems would still follow the crude methods of a generation ago.

The chief writings of Fechner are *Elemente der Psychophysik* (1860), *Zur experimentalen Aesthetik* (1871), *Vorschule der Aesthetik* (1876), *In Sachen der Psychophysik* (1877), *Revision der Hauptpunkte der Psychophysik* (1882), *Über die Psychischen Massprincipien und das Webersche Gesetz* (Wundt's *Philos. Stud.*, IV, 1887, pp. 161–239). J. E. W. W.

See portrait opp. p. 582.

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FECHNER'S LAW. — See PSYCHOPHYSICS; FECHNER.

FEDERAL GOVERNMENT AID TO EDUCATION. — See NATIONAL GOVERNMENT AND EDUCATION.

FEDERAL PLAN. — See CLEVELAND PLAN.

FEDERATION OF TEACHERS. — See TEACHERS' VOLUNTARY ASSOCIATIONS.

FEEBLE-MINDED, EDUCATION OF THE. — See ABNORMAL; ATYPICAL; DEFECTIVES, SCHOOLS FOR; EXCEPTIONAL CHILDREN; SPECIAL CLASSES.

FEEDING OF CHILDREN. — See FOOD AND FEEDING OF SCHOOL CHILDREN.

FEELING. — A popular term which has also been used in technical psychology to distinguish a phase of mental life, which is exemplified by such experiences as pleasure, displeasure, excitement, and strain. In popular parlance the word is very commonly used also to refer to skin sensations and organic sensations. In technical writing this use of the term is not favored, a distinction being drawn between sensations and states of pleasure, excitement, etc., which are regarded as distinct from sensations. Organic sensations are frequently accompanied by intense feelings of pleasure or displeasure, and consequently there is justification for the close relationship in ordinary usage between the term "feeling" and the organic sensations.

Feeling is one of three distinct types of mental activity long distinguished in psychological literature. (See MENTAL PROCESSES, CLASSIFICATION OF.) It is contrasted with intellect and volition. In its complex forms it manifests itself in emotions (*q.v.*). Various views exist with regard to the different types of feelings. Some writers distinguish only two varieties of feelings, namely, pleasure and displeasure. (Külpe, *Outlines of Psychology.*) Others distinguish six. Thus Wundt (*Outlines of Psychology*) distinguishes pleasure, displeasure, strain, relaxation, excitement, and depression. Feeling is intimately related to activity. C. H. J.

See EMOTION.

FEES.— So little has been written or is known of the history of school fees and charges that Dr. Kennedy's dictum in a famous paper (see FREE SCHOOLS) that all schools were free before the Reformation and that school-keeping was not "a gainful profession" has been accepted almost as a truism. It is in fact the reverse of the truth. The earliest school references in literature show that tuition-fees and entrance-fees were the rule, free education the exception. Thus the "Mean man" in Theophrastus' *Characters*, written *c.* 300 B.C., if his sons do not attend school every day because they are ill, makes a proportionate deduction from the fees and in the month of Anthesterion, in which there are many holy days, will not send them at all, so as to save the fees. In Greek Schools the fees were paid monthly at the end of the month and voluntary absence made no difference, as the angry mother of a truant son in the *Mimes* of Herondas *c.* 250 (iii. 3) complains that he hardly knows the school door by sight, but she has to pay on the 30th all the same. As to what the fees were, no indication is given. The elementary schoolmasters, like those of England before 1870, were a poor and despised class like Æschines' father who, when ruined, betook himself to teaching, with Æschines to help him "in grinding the ink and sweeping out the schoolroom, the work of a slave not of a free boy," while Lucian in relegating tyrants in a future state to the position of elementary schoolmasters puts them on a level with the vendors of fried fish in the streets. The sophists, who may be compared with our university lecturers or the headmasters of great public schools are said by Plato, their great rival who charged no fees, to have made large sums. Thus Prodicos charged £2 for a single lecture, though it could be had in a short form for 10*d*; while he also had lectures at £5, 1*s*. 5*d*. and 3*s*. 4*d*. (Plato, *Axioch.* 366, in Freeman's *Schools of Hellas*, p. 168). Isocrates however a few years later says that Gorgias, the most successful of his time, who never married or paid any taxes, only made about £800. A whole course in ethics was given for only 3 or 4 minas or £12 to £16.

The only evidence of the amount of tuition fees in Roman schools is a line in which Horace (*Sat.* I. 6, 7, 5) says that his father took him to school at Rome as he did not care to send him where his country neighbors sent their sons at 8 asses a month, which Dr. Wilkins (*Roman Education*) says is about 4*d*. a month, or 1*s* of our money. Even this is a disputed reading. Quintilian (*q.v.*), a century later, made a fortune, but in this respect, Juvenal calls him a white crow. When the Roman schools were endowed by the Emperor Vespasian he gave the rhetoric schoolmasters 10,000 sesterces, equal to £800 a year. Gratian, 300 years later, in 376, ordered that a rhetoric master should have 24 *annonae*, and a grammar master half that, equivalent to about £1248 and £624 a year, taking an *annona* or the year's pay of a working man at £1 a week. In Trier, the then capital of the Western Empire, the tariff was 30 *annonae* for rhetoric, 20 for Latin, and 12 for Greek grammar masters.

In England, the earliest mention of school fees yet forthcoming is at Bury about 1180, when Abbot Samson bought a stone house in the town and assigned it for a school, on condition that poor clerks should be forever free of the contribution to the master for rent of a penny or a halfpenny twice a year. Some eighteen years later he endowed the master with a pension of 3 marks (£2) a year from a rectory, and directed that in return, forty poor clerks should be quit of all pennies (*denariorum*) which the schoolmaster, according to custom, exacted for his teaching. Whether the tuition fee really was a penny, *i.e.* a penny a quarter, or 4*d*. a year, does not exactly appear. But that would amount to £1 3*s*. 4*d*. a year on forty boys, giving two thirds of the benefit of the endowment to the parents of scholars, among whom the monks' relations had a preference for being free scholars, and one third to the master.

It is not till a century later that we get a record of the tuition fees actually paid, and this is at Oxford in the Merton College accounts of the founders' kin for whom the College had to provide a grammar school education. In 1277 the College paid the master of glomery (a corruption of grammar) for five boys 1*s*. 8*d*. from April 14 to July 20, *i.e.* one term, or at the rate of 4*d*. a head a term. Their washerwoman and serving boy together cost precisely the same, and one pair of stockings at 8*d*. cost twice as much as their teaching, while their commons or board was at the rate of 8*d*. a week. In 1300 the same sum of 4*d*. a head a term was paid for seven boys, with 2*d*. more for the vice-monitor's *dica* or tip, and 1*d*. to the boy, probably the boy who swept the school. In 1305 4½*d*. each was paid for eight boys for the winter term, 6*d*. for two other boys, while in the Lent term 5*d*. each was paid for seven boys, and in the summer term only 4*d*. In 1308 the "scolage" of nine boys with the usher's *dica* came to 4½*d*. each, of which probably the master got 4*d*. and the usher ½*d*. There were apparently only three terms a year, the autumn term being occupied by the long vacation. In 1347 Master John of Cornwall, who is celebrated as being the first grammar schoolmaster who taught the boys to translate Latin into English instead of French (see Anglo-Norman Dialect) was paid 10*d*. for the salary of his school, *i.e.* apparently rent for the schoolhouse with 2½*d*. to his usher, and 4½*d*. each a term was paid for tuition fees. Another 2*d*. a week was paid for having the grammar boys taught writing, whether to the same master or another, does not appear, but this was apparently in the long vacation. So closely were the fees calculated that, when one of the four boys learning writing was ill for half a week, the college, like the "Mean man" in Theophrastus, only paid a penny for him. A *donat*, or elementary grammar, cost, in 1309, 3*d*.; and a Horace in a feeble state (*debilis*) cost in 1347 only a halfpenny. It is strange that for tuition fees as late as 1347 only 4½*d*. a term was paid, as an Oxford University Statute of 1338, while forbidding grammar schoolmasters there to charge more than 8*d*. a term, did so with the proviso "unless he has only one or a few pupils to teach by special agreement." By 1383, as a result no doubt of the rise in wages and scarcity of masters, caused by the Black Death and the French Wars, while the commons of the boys was still 8*d*. a week, a shilling and, in some cases, two shillings a term was paid to the master. One boy paid also a shilling for a master for the summer term "to learn accounts."

In 1403–1404, Mettingham College, a collegiate church in Suffolk, paid 8*d*. a term for each of two boys whom they sent to Beccles School for their education, and 1*d*. a week for a broken term of six weeks only, a normal term being eight weeks, while paying 7*d*. a week for board of one of them. In the Gloucester School case, reported in the *Year Books* in 1410, an action brought by the two masters of the licensed grammar school against an unlicensed competitor who had set up a rival school, the masters said that the competition had brought their fees down from 2*s.* to 3*s.* a quarter to one shilling or less. It was probably the exorbitance of the charge that caused the competition.

When a grammar school was founded at Newland in Gloucestershire in 1445 by Robert Gryndour, it was to be "half-free forever"; that is to say, the master was to take "of scolers lernynge gramer 8*d.* the quarter and of others lernynge lettres and to rede 4*d.* the quarter." Whether we are to infer that 1*s.* 4*d.* was the normal fee for grammar boys and 8*d.* for boys learning to read, or that the half-freedom was secured by charging the latter only half-fees, is not clear. The Bishop of Norwich had settled the tariff at Ipswich in 1477 at 10*d.* a quarter for grammarians, 8*d.* for psalterians (those learning Latin out of the Psalters), and 6*d.* for primerians, or those learning their primer or elementary Latin grammar. With those learning A B C, called Apesyes, and singing "Songe" the grammar master was to have nothing to do. The town found the tariff too high, as in 1482 they reduced the fees for burgesses living in the town to 8*d.* a quarter and no more. Even so the tuition fees were found so burdensome apparently, that Robert Felaw, the Portman or Mayor, endowed the school and made it free of tuition fees altogether. As the movement for universal free schools was then in full swing, it is difficult to find records of tuition fees after this. All the great endowed schools, from Eton downwards, were free schools. In the next century a rapid rise took place in prices. Thus we find in 1548 a royal ward boarded with one of the gentlemen of the chapel royal paying 21*s.* 8*d.* for a quarter's board. In 1561 the sons of Sir William Cavendish paid 10*s.* a week for their board at Eton in a dame's house and 3*s.* a week as *commensalis* in college, while in 1598 a gentleman at Carlisle paid £2 a year for his son's "quarter's board at Christmas, and for his schooling that quarter 10*s.*" At Winchester in 1619 John, son of Sir Timothy and grandson of Archbishop Hutton, paid 5*s.* a week for his board as a Commoner. But this was in addition to 4½*d.* for a pound of candles for six weeks and charges for fire, school sweeping 2*d.* and birch 4*d.* Quarterage, *i.e.* tuition fees, were at the rate of 1*s.* 6*d.* a quarter plus 1*s.* 4*d.* entrance fee. At Colchester in 1637, though nominally a free school, the freedom was limited to sixteen free scholars, and others paid 10*s.* a quarter for teaching, 1*d.* for firing, 2*d.* for sweeping, and a pound of candles for lighting. In 1709 the quarterage at Winchester was still the same. In 1731 the ten Commoners in College paid Dr. Burton the amazing sum of £200 a year for their board, which is dear even for the most aristocratic school to-day, but they were all young noblemen, and he took them out hunting on holidays. The school bill of the first William Pitt, afterwards Earl of Chatham, at Eton in 1719, was £29 0*s.* 3*d.* for half a year (or at the rate of £60 a year), of which tuition accounted for 7 guineas, viz. 4 guineas, 2 guineas to the usher and £1 2*s.* to the writing master.

At Rugby, by foundation a Free Grammar School, in 1777 the boarding fee was 14 guineas a year. In 1794 the leaving "present" of a guinea and the Christmas present of another guinea were abolished and a tuition fee of 5 guineas imposed. In 1797 the boarding fee was raised to 20 guineas a year; in 1818 it was 40 guineas with 4 guineas extra "for a single bed," and £4 for washing; tuition fees being 6 guineas. At the same time Winchester charged £64 a year, of which 16 guineas was for tuition; Eton £66 a year, of which 16 guineas was for tuition. The total cost of a boy at either was said to be £100 a year. At Eton extra charges were made for noblemen and gentlemen of very large fortune in tutors', as distinct from dames', houses. At Harrow the charge was £125, of which 20 guineas was for tuition. Westminster and Shrewsbury both had the remarkable extra of 5 guineas and 4 guineas for a single bed, making 50 guineas at Westminster and 44 guineas at Shrewsbury with 13 guineas for tuition at the former and 6 guineas at the latter. At the smaller schools, distinctions were made between parlor and other boarders, *e.g.* at Wotton-under-Edge the former were charged 50, the latter 30 guineas, a year; at Exeter the boarders paid 30 guineas, inclusive of tuition, for which day-boys paid 12 guineas at Repton. At Eton, under Regulations made in 1907, the charges for oppidans are £21 entrance fee; and £115 a year for board, £30 for tuition plus £21, practically obligatory, for private tuition, £166 in all. Scholars pay £30 a year. At Winchester the charge for scholars is £21 a year. Commoners pay £127 a year, of which £47 17*s.* is for tuition. Private tuition is almost unknown. In the cheaper so-called "Public Schools" the charge is from £80 to £100 a year. At the great Day Schools, Cheltenham College charges £36 a year; St. Paul's School, London, £24 9*s.*; Bedford Grammar School, £16 16*s.*; Merchant Taylors' School, London, and Manchester Grammar School, £12 to £15 15*s.*; Bradford Grammar School, £10 to £16; Wyggeston School, Leicester, £7 7*s.* These are all schools of 500 boys and upwards. The lesser grammar schools charge from £25 to £60 a year for boarders; and from £6 to £12 a year tuition fees. The new secondary schools, maintained by County Councils, charge from £3 to £6 a year, and in the majority of cases the latter sum. But in these schools generally more than half the scholars are freed from fees by various forms of exhibitions and scholarships, and by the regulations of the Board of Education there must be not less than 25 per cent of free places. A. F. L.

See FREE SCHOOLS.

Germany. — In the medieval town Latin schools the practice grew up for the towns to pay the rector a lump sum by way of salary, but he was allowed to supplement this by customary contributions from the pupils; thus in winter they were expected to provide wood and candles; a small gift was given to the teacher by each pupil at the beginning of holidays (*Austreibegeld*); presents in kind were given at certain seasons of the year, *e.g.* at Midsummer's Day, Christmas, Palm Sunday, when a cock was given; and as in England the pupils had to pay for the maintenance of the strap (*Rutegeld*). In many cases these presents were commuted into a recognized monetary contribution. Other perquisites belong to the teacher at different times, *e.g.* free board, income from sale of books, which was frequently protected by the appointing authority against other booksellers, fees from weddings, funerals, and baptisms, collections by itinerant singing, and payment as town notary and scribe. Where a municipality recognized a higher school, German or writing school, it was often the practice for the keepers of these schools to surrender a portion of their fees to the regularly licensed teacher. Fees were paid quarterly, but there was no universal scale or standard. Under the influence of the Reformation it is interesting to notice that the attempt to introduce compulsory attendance at school was accompanied either by the abolition of fees or by a differentiation in favor of the poor. Thus the Leisnig Treasury Ordinance of 1523 abolished fees for inhabitants; so, too, the Halle Church Ordinance (1526); the Brunswick Church Ordinance of 1528 retained fees for the rich, as also did the Ordinances of Brunswick-Wolfenbüttel (1545). The salaries of teachers were provided for in many cases out of the funds of confiscated church property, out of church funds, or out of endowments. Teachers in girls' schools or in vernacular schools frequently received only an honorarium from the local community and charged fees. The Nuremberg Guild of Teachers had a regular scale of charges for writing pupils, non-writing pupils, and private pupils, along with entrance and leaving fees, wood and gifts at New Year, Easter, Pentecost, and Christmas. In Berlin the scale for private schools was 6–9 *pfennig* for spelling, 1 *groschen* for spelling and reading, 1 *gr.* 6 *pf.* for writing and 2 *gr.* with ciphering. In Prussia, by an ordinance in 1717, education was made compulsory and fees were fixed; in 1736 the *Principia Regulativa* provided for the payment of fees by all children between five and twelve, whether attending or not. The scale of charges fixed by the *Generallandschulreglement* (1763) were 6 *pfennig* up to reading, and 9 *pf.* thereafter; a *groschen*, if writing and ciphering were added. In summer only two thirds of these amounts were charged. The *Allgemeine Landrecht* (1794) attempted to abolish fees and to distribute the payment of teachers among residents according to their wealth. But the payment of fees continued in spite of the law. During the nineteenth century the payment of fees was gradually reduced, and the teachers were paid by the local authorities and supplemented this by fees for church duties as organists and sextons. By the *Constitution* of 1850, Art. 25, instruction in the public elementary schools was declared free, but this provision remained practically a dead letter and the question continued to be actively agitated. An attempt was made to impose fees universally in 1868–1869, but failed. Falk and Bismarck, however, ranged themselves on the side of abolition. While the central authority was in favor of abolition, the district bodies desired to retain them. The law of June 14, 1888, revised on March 31, 1889, abolished fees in the elementary school, and retained them in the *Bürgerschule*, or higher elementary schools. An exception may, however, be made in the case of non-residents attending schools in another district, and where the state apportionment does not cover any extraordinary expenses for the maintenance of fees. In the latter instance the approval of the central authority must be renewed every five years. In Bavaria the cases where school fees are still exacted are decreasing, and they are no longer retained in any of the larger towns. In Württemberg very low fees are charged, while Saxony has by statute fixed a scale of charges according to the type of elementary school (graded or ungraded or higher), the poor being relieved of the burden without incurring themselves any stigma of pauperism thereby.

In the secondary schools fees are universally charged and vary according to the authority maintaining the school, *i.e.* state or city, the type of school, and the section of the school attended. Thus in the Gymnasium, Realgymnasium, and Oberrealschule maintained by the state the annual fees in the upper classes are 150 M., 130 M. in the lower classes and pro-Gymnasium, and 110 M. in the Realschule and middle schools. In the city schools they vary, being in some cases lower, in some higher, than in the state school. In Bavaria the fees are 45 M. in all types of schools; in Saxony the charges in the Gymnasium, Realgymnasium, and Realschule are 150 M. with some variation, as in Leipzig and Dresden; the fees in Württemberg are 40 M. in the lower section of the Gymnasium and 60 M. in the higher; in Saxe-Weimar the Gymnasium charges 120 M. and the Realschule 80–100 M.; in Baden the fees in state schools are 108 M., while in other institutions there is great variation. In the girls' high schools in Prussia the fees vary from as low as 36 M. to 180 M. a year, the median being about 100 M.; in the middle schools the average fee is 40.74 M. a year, the general range being from 18 M. to 96 M.

France. — The idea of public free education was first seriously agitated during the period of the Revolution. Until then fees were paid universally, except in the few cases where pastors had opened charity schools for children of the poor. The teaching orders also maintained two types of schools, the one well housed and equipped for fee-paying pupils, the other less pretentious and free for poor children. Talleyrand insisted on the principle of free elementary education as the basis of a democracy. There was some proposal in the constitution of 1791 to make education free, but it was not carried out and was withdrawn in 1795 and provision was made by which the schools were to have one third of their places free, a figure reduced in 1802 to one tenth. In 1833 children declared by the municipal council to be unable to pay fees were to be admitted free; this was extended in 1850 to all children who were unable to pay and communes were permitted to maintain free schools. The result was a large increase in free pupils and in the state subsidy, and a decrease in the receipts from fees. Duruy in 1865 proposed the entire abolition of all fees, and in 1867 the communes were authorized, if they desired, to establish free schools and received a subsidy from the state and department. Fees were finally abolished entirely by law of June 16, 1881.

During the early part of the nineteenth century fees were fixed by the municipal authorities; they might be paid in money or in kind or both; and there was a scale according to whether the pupil learned reading, reading and writing, or reading, writing, and arithmetic. Two to six sous, in some cases eight sous, a month seems to have been the usual range of charges for elementary work. For a long time the teachers had personally to go through the indignity and humiliation of collecting the fees in person. By 1833 they were collected in the same way as other town rates. Frequently the fees were supplemented by a salary from the commune, and in 1850 a minimum of 650 *frs.* from fees and salary was fixed.

The fees in the French *lycées* show the greatest diversity, according as a school is in Paris or the provinces, or the pupil is a day pupil, a supervised day pupil, a half or full boarder. The fees for day pupils vary from 40–70 *frs.* in the provinces and 90–100 *frs.* in Paris in the lowest classes to 320–500 *frs.* and 650–700 *frs.* in the highest; for supervised day pupils the fees are from 60–100 *frs.* and 130–140 *frs.* to 380–590 *frs.* and 740–790 *frs.*; for half boarders from 225–400 *frs.* and 500–550 *frs.* to 575–725 *frs.* and 950–1200 *frs.*; for boarders 350–700 *frs.* and 900 *frs.* to 950–1250 *frs.* and 1650 *frs.*

United States. — The colonial period opened with the almost universal custom of charging tuition. Besides the income from this source a salary was frequently guaranteed to the master. In Massachusetts and Connecticut these salaries began at an early date to displace the tuition fees (see Free Schools). Among the Dutch of New Netherland and colonial New York a combination of tuition charges and salaries was invariable in the public schools. In other colonies the same custom generally held in the case of schools that were in any sense publicly controlled. Throughout the colonies there was found more or less effort to exempt the poor from the customary tuition fees.

In spite of widely varying conditions the actual tuition charges throughout the whole colonial period were much alike, varying of course with the degree of advancement in learning. At Waterbury, Mass., in 1692, the town meeting fixed the charges as follows: "english: 3:pence Per weeke & for wrighting: 4:pence per weeke & for latten: 6: pence per weeke for each scoller." At New Amsterdam in 1661 the burgomasters thus regulated the elementary school charges: —

"From every pupil quarterly as follows: —

For each child whom he teaches the a b c, spelling and reading . .	30 st.	(60 cts.)
For teaching to read and write . .	50 st.	($1.00)
For teaching to read, write, and cipher	60 st."	($1.20)

The New Amsterdam Latin school at the same time charged six guilders ($2.40) a quarter. The schools of the S. P. G. (see Society for the Propagation of the Gospel) charged fees for those able to pay. The teacher in one of these schools on Long Island (1714) received "5 shillings per quarter (pay) for each scholar." The same rate was charged in a Pennsylvania German parochial school at Lancaster (1747), and in a similar school in Philadelphia (1760).

An indentured servant, sold as schoolmaster in Virginia (1774), charged the same rate for pupils outside of his master's family. Somewhat higher were the rates in the school of the Reformed Dutch Church of New York (1755): "for reading only, 5*s.*; for reading and writing, 8*s.*, with 6*d.* for pen and ink; for reading, writing, and ciphering, 10*s.*; for singing, 6*s.*" It is interesting to note that, while in New England rates are frequently given by the week, in the middle colonies they are almost always given by the quarter, and in the Charlestown, S.C., Free School (1712) they are given by the year. Rates in the evening school were higher than for the day school; thus at New Lotts, Flatbush, N.Y., in 1680 the charges for day school per quarter were three guilders for a speller or reader, and four guilders for a writer; while for the evening school the corresponding rates were four and six guilders, respectively. (The guilder in wampum was then worth about eight cents.)

Most of the figures available for the colonial period show simply the ordinary tuition fees. A few others, however, are worthy of note.

In the Philadelphia school (1683), where tuition was four, six, and eight shillings for reading, writing, and ciphering, respectively, we find the statement: " boarding (diet, washing, lodging, and schooling) tenn pounds for one whole year." In rural Pennsylvania (1678–1679) a master agreed with a father to teach his children " to Read ye bybell & if he could do itt in a yeare or a halfe yeare or a quartr. then we was to have 200 guilders." Occasionally in Massachusetts the tuition fee assumed the nature of a town rate with incidental correction for wasting opportunities. Thus at Hadley, Mass., in 1677 " all male children ffrom six years ould to twelve shall . . . pay to the scool such as goe . . . tenn shillings by the year and they that goe not ffive shillings by the year and all others above the age expressed that are found Illiterate and goe not to paie ffive shillings by the yeare." The custom, common elsewhere, of entrance fees and of stated presents to the master took little or no hold in colonial America. The only instance of the entrance fee noted below the college occurs in Boston (1741), where " entry money " was demanded of " strangers," that is, of non-residents. One quasi-fee, additional to ordinary tuition, seems to have been common in the north, the obligation on the part of the pupils to furnish fuel. The Boston master, of the quotation above made, said, " as to Firing he had not more than Five Shillings apiece " from the pupils. In more rural communities the fuel itself was required. At Flatbush, N.Y., in 1773, each pupil must bring " every nine months a load of wood." (See COLONIAL PERIOD IN AMERICAN EDUCATION.)

With the close of the colonial period a new institution appeared in America, the academy (*q.v.*). Generally these schools charged tuition (even where the elementary schools were free). The Augusta Academy in Virginia (1775) fixed tuition at " £4 per annum for each scholar." Phillips Exeter Academy until 1812 charged no tuition, but in that year fixed its rates at $3 per quarter. Board in connection with this school was $2 per week (1799). In 1816 a county academy in Georgia, which taught also the elementary branches, advertised " rates of tuition as follows: Spelling, Reading, Writing, and Arithmetic, ten dollars per annum for each scholar; English Grammar and the higher branches of the Mathematics, fifteen dollars; Greek, Latin, and French Languages, twenty-four dollars, payable quarterly in advance." Board was had at " from sixty-five to eighty dollars per annum." During the '30's the ordinary New England academy charged tuition at from $3 to $5 per quarter. In the more rural districts board in connection was advertised at from $1 to $1.50 per week. The New York academies are fully reported by the Regents. In 1836 most rural rates of tuition were: for the elementary branches, $2 or $3; for the higher English branches, $4 or $5; for the classical languages, $5 or $6. Board in the neighborhood varied from $1.13 to $3, with a median of about $1.75. Until the Civil War there was little change in the rural charges, board going up a very little. More high-priced schools, however, entered the field. Even in 1867 there had been little increase in tuition, although board had doubled, averaging now about $4.50 per week. With the advent of the public high school tuition charges were dropped from public secondary education. The academies which survive are almost exclusively privately controlled preparatory schools. Among the better known are the Phillips Exeter and Andover, and St. Paul's, N.H. The former charge per annum tuition $150, room $35 to $200, board $140 to $270; the latter charges $850 for tuition and residence, besides laboratory and other fees. The more fashionable girls' schools charge higher rates, charges of $500 being not unusual, tuition and residence often exceeding $1000.

The philanthropic school societies (see PUBLIC SCHOOL SOCIETIES), which in the early nineteenth century prepared the way for general public support of education, sometimes admitted pay pupils as well as charity pupils in order to remove the stigma attaching to purely charitable institutions. The Augusta, Ga., free school, conducted ' on the Lancasterian system ' offered (1821) " the best English education for three dollars per quarter or for nothing according to the pleasure or ability of the party that enters." The New York Public School Society, in trying the same experiment, agreed in 1826 upon the much smaller fees of twenty-five cents per quarter for the three lowest grades, fifty cents for the three next, and one dollar for the three highest grades. Eventually, these pay schemes failed. (See FREE SCHOOLS.)

The history of the gradual displacement of school fees in America by public funds is the history of the public school system. (See FREE SCHOOLS.) Massachusetts led in the movement, abolishing fees from the town schools during the first half of the eighteenth century. Connecticut and New Hampshire soon followed. Elsewhere little was done in this direction until the nineteenth century. So opposed were people in general to the idea of taxation for school support that at first only small appropriations could be secured. Such inadequate funds might be used along one or more of three lines: (1) to pay the tuition fees of the poor ; (2) to furnish part of the school support, leaving tuition fees to supply the remainder ; or (3) to provide free instruction for all during a term less than the full scholastic year. The first plan has been the initial stage of each developing system. In New England this step was taken in early colonial days ; elsewhere not until the nineteenth century. Pennsylvania, for example, from 1802 to 1834 had a state policy of this kind. In the South it was the usual form of state support of elementary education until the Civil War. The second line of procedure, which combined public support with tuition fees, in effect lessened the fees of all. This was in many places a second stage in the evolution of public support. New York State combined this plan with the preceding (and with the succeeding) until 1867, the proportion of school funds raised by "rate bills" (tuition fees) dropping from nearly all at the inception to 60 per cent by 1836 and to 9 per cent by 1867, when the schools were made entirely free. It may be added — strange as it seems — that the proportion of school districts in New York which gave free tuition to the poor declined from above half in 1819 to only one in four by 1867. The third plan, that of keeping a shortened session absolutely free, was early devised in colonial Massachusetts, where it remained the rule until the Horace Mann revival. In most of the states this too has formed a transition to the complete public school system. In fact, many of the states may be said even yet to be in this transition stage.

The colleges during the colonial period made but small tuition charges. At William and Mary the charges were "20*s*. entrance and 20*s*. a year for Pupilage for each scholar" (1724). Until 1810 the charges at Yale did not exceed 33*s*. From that time they have gradually increased: $33 from 1810 to 1852; then by stages of $38, $45, and $60 to $90 in 1870; from 1874 to 1887, $140; since 1887, $155. Harvard in 1833–1834 published fees as follows: —

Instruction, Library, Lecture-room, Steward's Department, rent and care of rooms	$90.00
Board for 42 weeks at $1.90	79.80
Textbooks	12.50
Special repairs, etc., about	3.00

In 1864 the first of these items was broken into $75 for tuition charges and $15 for "rent and care of rooms in the college building." Since 1869 tuition fees of $150 have been exacted. Wide diversity prevails at present among American colleges in regard to fees. The state universities for the most part charge nothing except for law and medicine. Privately endowed institutions generally exact fees, though a very few (*e.g.* Leland Stanford) charge nothing except in the professional schools. The amount of the fees exacted is roughly correlated with the financial strength of the institution. Those institutions whose invested funds fall below a half million of dollars group, in the matter of tuition fees, about a central tendency of $45 or $50 a year; where the invested funds lie between a half million and two millions and a half, the central tendency of fees is $90; for universities whose funds are above two and a half millions, the fees group about a central tendency of $125. In the last case all those having funds exceeding five millions (except Leland Stanford) charge about $150. The figures just given apply to fees in the purely literary department only; in the vocational courses (law, medicine, engineering) the fees generally run higher, the maximum being $250 in medicine and engineering (Columbia, Massachusetts Institute of Technology).

Besides tuition fees, charges are ordinarily made in the laboratory courses for materials. A matriculation fee, perhaps of $5, is paid once. Gymnasium fees of from $5 to $10 are often exacted. A diploma fee of $5 or $10 is usual. For the higher degrees examination fees are often charged, amounting sometimes to $35.

Two fairly distinct but opposing tendencies seem to emerge from the foregoing discussion. On the one hand, privately endowed institutions, principally in the East, have during a long period of years been increasing their fees, apparently as much as they can without unduly cutting down attendance. On the other hand, the state, principally in the West, has been taking over more and more of education, with the consequent elimination of fees from the elementary school up through the university. W. H. K.

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FELBIGER, JOHANN IGNAZ VON (1724–1788). — A prominent educator in Silesia and Austria. After studying theology at Breslau, he joined the Augustinian Order at Sagan in Silesia, where he subsequently became abbot, and had oversight over the churches and schools. His interest in education was aroused by the necessity of reforming the schools under his supervision and by the *Reports* issued by the Berlin Real School, established by Hecker (*q.v.*). He visited the school at Berlin, and was struck by the provision there made for the training of teachers, and by the tabular and alphabetic method employed by J. F. Hähn, one of the teachers of the school. On his return he sent young men to be trained at Berlin, and himself set about the work of reform. He founded a number of normal schools, taught personally, issued textbooks and catechisms, and improved the material conditions of the teachers. In 1765 he drew up, at the request of Frederick the Great, the *School Regulations for Roman Catholics in the Duchy of Silesia and the County of Glatz.* He introduced better teachers, minimized rote work, insisted on simultaneous instruction and uniformity of instruction. For these ends he issued tables dealing with different subjects in their divisions and subdivisions. These tables were placed or hung before the class, and all the pupils could be employed on the same thing at the same time. The alphabetic method was a mnemonic device by which initial letters of words or sentences were memorized for purposes of recall. In 1774 Felbiger was summoned to Austria by Maria Theresa as General Director of the School System of the Austrian States, and laid the foundation of the present Austrian system; he repeated the work which had been so successful in Silesia, and now exercised great influence throughout Catholic Germany. His activity was cut short by his retirement in 1780 by the orders of Joseph II, who limited him to the Hungarian schools. The strength of Felbiger was his insight into educational needs; the defects of his systems were the introduction of extremely mechanical processes of administration and instruction. Felbiger died at Pressburg in 1788. His chief works were *Forderungen an Schulmeister und Lehrer der Trivialschulen* (*Directions to Schoolmasters and Teachers of the Primary Schools*), *Eigenschaften, Wissenschaften, und Bezeigen rechtschaffener Schulleute* (*Qualities, Knowledge, and Characteristics of Proper Schoolmen*), and *Methodenbuch.*

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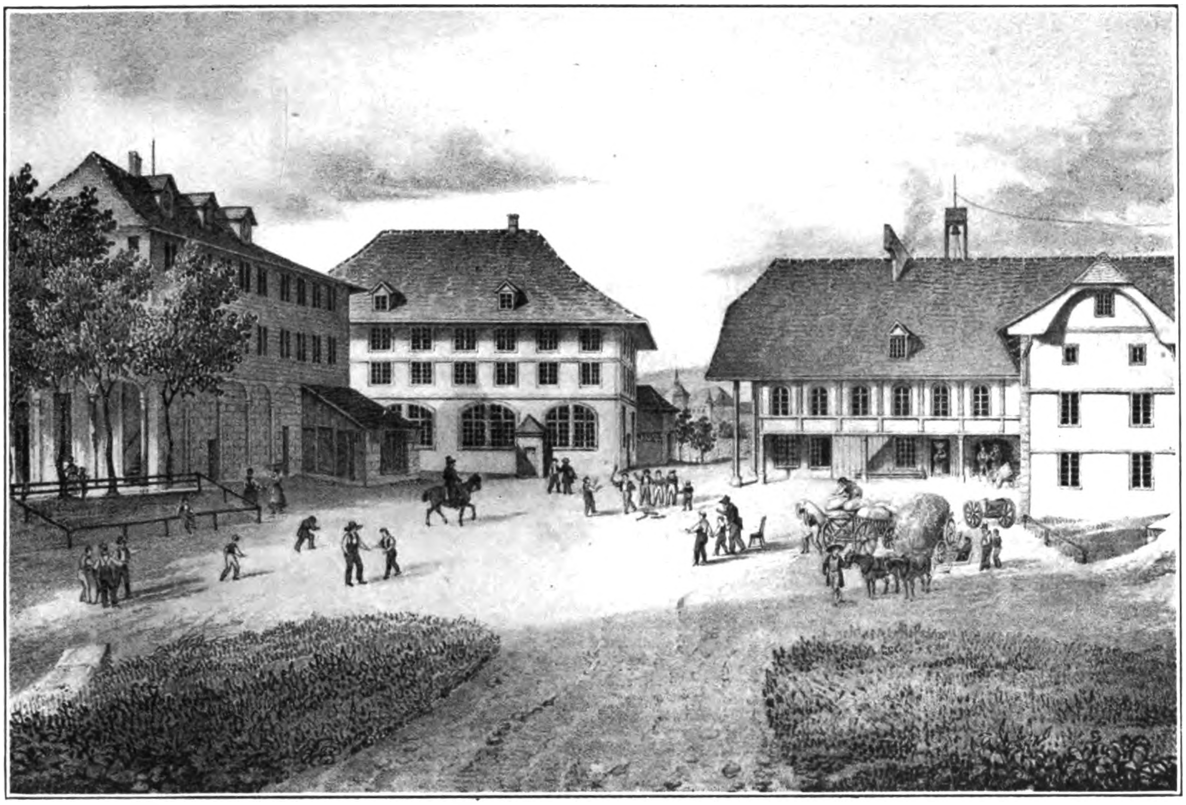
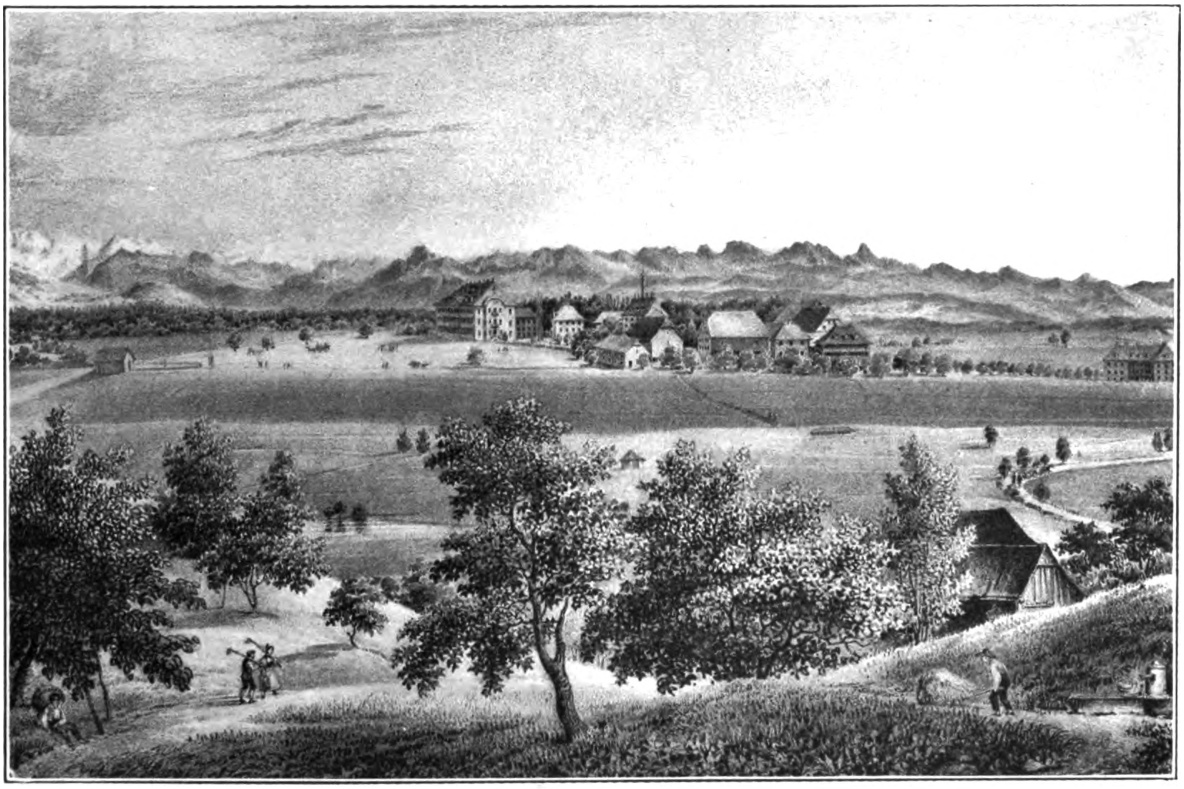
FELLENBERG, PHILIPP EMMANUEL VON (1771–1844). — Swiss philanthropist and educator; born at Berne of a noble family. His father was a man of considerable learning, and his mother was imbued with a deeply religious spirit. Under such influences, to which was added the pitiable condition of a large part of the Swiss population at that time, it was not surprising that Fellenberg devoted himself to educational reform. For him the only means for the moral and economic improvement of a country lay in education. His early efforts were directed to the education of his own children, to whom he soon added a few others. In 1807 he founded the Literary Institution or Academy, in which the children of nobles and gentry were to be received. The Fellenberg home was close to Neuhof, and an intimacy sprang up between the older Fellenberg and Pestalozzi, in which the son soon joined. Not only was he stimulated by Pestalozzi's ideas, but his father had delivered an address before the Helvetian Society on *The Necessity of Improving National Education*, which encouraged him to apply himself to a study of education. The age, too, was one of philanthropic and humanitarian movements, and several experiments had already been made in his own country, with which he was familiar; and a literature on the subject had sprung up under Basedow's influence. In 1799 Fellenberg purchased an estate at Münchenbuchsee, which, under the name of Hofwyl, was to become widely known. In 1804 he undertook the education of some poor children, and associated Pestalozzi with the work, but the overpowering administrative routine and executive thoroughness of Fellenberg were too much for the great teacher, whose only guides were sympathy and affection. An effort made in 1817 to combine forces failed for similar reasons. Fellenberg's charity school did not meet with great success until it was placed in the charge of Wehrli (*q.v.*) in 1808, and developed into the agricultural or poor school. A normal course for Swiss teachers was introduced during the summer vacation entirely at the expense of Fellenberg, but through some jealousy the Berne teachers were soon forbidden to attend. A real intermediate or practical school for the children of the middle classes was founded in 1827, while in 1823 Fellenberg's wife had already founded a school for poor girls, which was under the charge of a daughter of the founder. The ideal which Fellenberg set before himself was to realize such a system as Pestalozzi had indicated in his *Leonard and Gertrude*, and in 1807 he called on his contemporaries to follow Pestalozzi's plan. The aim of his institution was " to develop all the faculties of our nature, physical, intellectual, and moral, and to endeavor to train and unite them in one harmonious system which shall form the most perfect character of which the individual is susceptible." He emphasized the need of vocational preparation in all grades of society; upright and noble leaders were as necessary as reliable and honest



Barn. Stable. School.

Court of the Agricultural School.



Bath House. Practical School. Classical Gymnasium. Agricultural School. Hotel.
Scientific Institute. Workshops of Tailors, Shoemakers, etc.

General View

FELLENBERG'S INSTITUTE AT HOFWYL.

followers. While the individual bent was to be followed in the choice of vocation, satisfaction with one's station in life was as important a lesson as any other work of the school. And in this way the vocational preparation was to be combined with moral and religious training. Educationally, too, Fellenberg regarded manual activity as the necessary complement to the sense perception and object teaching of Pestalozzi. Thus the most significant feature in these schools was the provision for manual labor. Hofwyl was an estate with an area of six hundred acres. The chief occupation was agricultural, not only for its physical and moral influences, but to defray the expenses of the institution. For the poor children such work was frankly vocational; for the pupils in the Literary Institution the aim was to prepare those who would some day have estates of their own to acquire an intelligent interest in their management. In addition to this occupation there sprang up other industrial employments, *e.g.* the manufacture and repair of agricultural implements, a printing establishment, the making and repair of clothes, and other work which a large institution daily called for. The pupils of the poor school were kept up to the age of twenty-one, and their studies included, besides reading, writing, and arithmetic, drawing, singing, natural history, geography, history, geometry, and mensuration, botany, agriculture, hand-work, and religion. Some of these pupils were later promoted to the higher departments and trained as teachers. In the higher school a reformed curriculum was introduced, retaining the classics, but also emphasizing modern languages, sciences, drawing, music, and the practical work. Physical exercise and military drill formed an important part of the work of all pupils in the institution. But, above all, Fellenberg laid emphasis on religious and moral education. While religion was regarded by him as a basis for morality, he did not neglect the moral training which comes from social contacts. The institution on a small scale was a copy of society, with its class divisions, which Fellenberg accepted as divinely ordained, and the individual was but a member in it; hence the relations between the pupils were important for the formation of moral character. For a time a system of self-government was tried, but was abandoned. On the whole, Fellenberg relied on the influence of example, strict vigilance, and the complete eradication of the slightest corrupting influences. Rewards and corporal punishment, in so far as these are external forms of stimulus, were not employed; true work was its own reward, and a boy who merited corporal punishment had no place in the institution. From Hofwyl colonies were sent out to neighboring districts; the best known of these was the colony of thirty boys which was settled in 1816 at Meykirch, about six miles from the central institution. After the death of the founder in 1844, the charge of the institution devolved on his elder son, William, who associated W. B. Mönnich with himself as director of the Literary Institution and the Real School. But one school after another had to be closed, until, by 1848, none remained. In 1884 the cantonal normal school was moved from Münchenbuchsee to Hofwyl.

The Fellenberg movement exercised a great influence on education in Europe and America. Among the pupils of the literary institution were found princes and nobles from most of the European countries. From America came Robert Dale Owen, the son of Robert Owen (*q.v.*). The institution was almost as famous internationally as that of Pestalozzi at Yverdun. As early as 1816 Lord (then Mr.) Brougham (*q.v.*), in giving evidence before an educational committee, referred in high terms to the work of Fellenberg, and led to some articles on the subject in the *Edinburgh Review*, Vols. XXXI and XXXII (1817 and 1818). About 1835 George Edmondson opened a school at Queenwood Hall, Hampshire, where he gave instruction in agriculture, maintained science and technical departments, a blacksmith's shop, and printing press, and emphasized practical instruction. Professor Tindall (*q.v.*) was one of his teachers, and Henry Fawcett (*q.v.*) one of his pupils. The most notable influence which came from the Hofwyl institution was not on the moral or intellectual side, but took the form of the manual labor movement in America, in which many colleges had their origin and in which may be traced the system of working one's way through college.

See Manual Labor Institutions.

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FELLOW OR FELLOWSHIP; SCHOLARS AND SCHOLARSHIPS.

England. — In the original English usage the term "fellow" was used in the universities of Cambridge and Oxford as equivalent to the Latin *socius*. Fellowship thus was applied in the literal sense, as "the spirit of equality and companionship which should prevail among the recipients" of benefactors' bounty. In the statutes of Merton College, Oxford, followed by many other colleges, the founder decreed that the college was to be called the House of the Scholars of Merton. The college was designed mainly for students in arts or philosophy, who would pass on to the study of theology "at the award of their Warden and Fellows" (*i.e. socii*), though permission might be given to four or five to be students in canon law, or even civil law. A grammarian was to be appointed to whom not only students in grammar, but also any of " the scholars," might have recourse to obtain instruction " in the Latin discourse or idiom." The number of scholars was to be dependent on the financial resources of the house, but each scholar was to receive annually fifty shillings (from which was to be deducted the cost of commons). The scholars were to be divided into classes of twenty, or ten, if necessary; and the discreetest of the scholars were to be chosen as præpostors or deans over the rest, and to act as coadjutors of the warden in " the care of the younger sort, and as to their proficiency in study and good behaviour." These præpostors were to have a somewhat more liberal allowance than the other scholars. Moreover, in every chamber in which scholars resided, one was to be chosen of more mature age than the others, " to have a superintendence over the other fellows." Throughout these quotations from the Merton Statutes, it will be seen that the students are " scholars " in relation to the college, and " fellows " in relation to one another. Whether senior or junior, all were called scholars, and in the whole body, warden and scholars, whatever their standing, was centered the whole control of the college. The colleges, consisting of secular students in training as secular clergy, became incorporated bodies, exactly parallel to the monasteries of regulars, and came to acquire " a share of that influence in the University which the establishment of powerful monasteries had almost monopolized in the hands of the Regulars, and wielding that influence for the benefit of the church in the advancement of the secular clergy, who for lack of support and encouragement in the Universities, were sadly decayed in learning." From a papal bull of 1280 it appears that Merton College was founded for forty scholars. Vacancies occurring were to be filled up by the unanimous vote of the warden, and at least six senior scholars, candidates of the founder's kin or those coming from a diocese in which the college held property to have the preference. All the scholars were required to dine together in the refectory, and one of the scholars was to read aloud in Latin during meals. The warden received fifty marks a year for his table, and had allowances for servants, wardrobe, and horses. Once a year he had to ride to examine the different estates belonging to the house, receive the rents for the past year, and fix them for the coming year. There were a vice-warden, three or four chaplains, three bursars, and five auditors of accounts, besides the deans. Attendance was required, " as far as their leisure serves," at the canonical hour of celebration of masses on holy and other days. The founder makes quite clear what he means by a fellow in the following article of the statutes: " Also the Fellows of the Society, as they were *fellows* in the intercourse of life to their lives' end, are in like manner, at their death, to have ecclesiastical burial among their fellows and brethren."

The scholars could retain their places so long as they did not break the rules by misconduct, or accept a benefice, or become regulars. They filled up the vacancies in their body, however numerous they might become, through increase of value of the estates left. Finally, to show how self-contained and self-governed the house was, in the election of the warden, seven of the senior scholars were to ask for nominations of persons " belonging to the House or elsewhere," from all the scholars; then having heard all they could as to the " energy, probity, and honour " of each suggested name, to choose the best three and to give in these three names to the visitor who was to make the final choice. Originally, then, the college was the body made up of the warden and the scholars, all living on the foundation, with allowances as settled by the statutes, living there ordinarily to study all their lives, unless they should be preferred to a benefice. They were all members of the society or house, therefore all *socii,* all fellows of one another.

About 1361, Simon Islip, Archbishop of Canterbury, founded a new college, called Canterbury College, at Oxford. The warden and three of the twelve fellows were Benedictine monks, the other eight being secular students. In 1365 the archbishop ejected the warden and the three monks, and substituted four secular scholars. The new warden appointed was the famous John Wyclif, and about the same time new statutes were drawn up. These statutes were devised to encourage graduates to pursue higher studies, rather than undergraduate work. The statutes show " how thoroughly the inmates of Canterbury College were regarded as members of one family, the term ' fellow ' being still used in its original sense of comrade. The fellows were to dress alike, to attend mass together in the early morning, to go together to the schools, accompanied by a servant who should carry their books, to take their meals together, to go out walking in couples after vespers, and at night to occupy four or five common dormitories." Wyclif and his fellows were ejected in 1370. No length of time was prescribed in the statutes for a scholar remaining in the college. It was a time of preparation for clerical life, in the first place. A boy came to the university, say at fourteen years of age, and the stages by which he attained to the highest degree in divinity and became a priest ran parallel, and both aims might be attained by twenty-five years of age. The scholars needed means of subsistence, to reach this double end, even if they went through all the stages normally, between fourteen and twenty-five years of age. But as they would vary in length of time, no limit was fixed. Moreover, although scholars might achieve their academic and ecclesiastical aims, yet, if no promotion were available, the scholars or fellows could hardly be turned out of the colleges on that account. Accordingly, as Huber supposes, the practice was established for the fellows to retain their allowances and residence until they obtained some benefice. Huber continues: " In the political tempests of the fifteenth century, nearly all other stipends disappeared and the whole academic population diminished, the College-Fellows became gradually the actual stem of the University. They generally became masters, and in fact applied themselves to the business of teaching, and succeeded to the authority of the ancient Teacher-Aristocracy." The tendency for the older students to need maintenance for longer periods made a differentiation of the fellowship as applied to the allowance to the older members of the foundation, and was transformed into a life maintenance for post-graduate distinguished students — and the term " fellow " specially applied to each, while the term " scholar " was given to the younger students on the foundation. At the Reformation, fellows had to show their acquiescence in the Protestant doctrines, but otherwise there was a survival of old custom, with regard to attendance at chapel and hall, and even as to celibacy. In both Oxford and Cambridge in the statutes of most colleges, fellowships were restricted to natives of particular counties, or dioceses; in some cases they were limited to those who came from certain schools. Sometimes they were chosen by seniority from the scholars; sometimes preferentially to be from the scholars. Sometimes fellowships were obtained by purchase. Sometimes they were conferred by mandate of the sovereign, but not without keen resistance by the university from 1577 onwards. (See Mullinger's *History of University of Cambridge,* Vol. II, p. 286, *et seq.*)

Similarly Sir Walter Mildmay, in founding (1584) Emmanuel College, Cambridge, the first Protestant foundation, endeavored to resist the growing practice of fellowships becoming a life maintenance. Though he included the restriction of vacating the fellowship within a year of admission to the doctor's degree, King Charles I arbitrarily overruled the statute, and Emmanuel College had to fall in line with the other colleges in 1627; and though the Long Parliament, in 1641, declared King Charles I's dispensation illegal, it does not seem that their action had much effect. Mullinger (*History of Cambridge University,* Vol. II, p. 387) says of the first half of the seventeenth century: " There is indeed only too good reason for concluding that the award of a fellowship solely on the ground of merit was the exception rather than the rule; and even the outgoing fellow generally contrived to obtain a certain ' consideration,' as the price of the exertion of his influence in favor of a successor." In 1649 John Hall, (*q.v.*), in his *Humble Motion to the Parliament of England concerning the Advancement of Learning and Reformation of the Universities,* advocates the reduction of those " Friar-like Lists of Fellowships " into a fewer number, and those retained to be given to specialists who may act as professors, and pursue original investigations on the one hand, and to others of " more patient heads " who shall instruct whoever come for instruction; and perhaps a third kind, for those " worn out with contemplations and those greater labors of the mind who might thus sit warm and know nothing less than necessity in their honored old age." " Six fellowships thus awarded," says Hall, " would do more than six score at this present do." The late Professor J. E. B. Mayor, in his *Life of Matthew Robinson* (p. 28, note 1), states on the authority of Calamy that there were fellowship examinations in 1650, which included versification, *viva voce* questions, and other exercises. But the examination apparently could be overruled by party spirit and personal considerations. Wordsworth, in *Scholae Academicae* (p. 344), notes that when Richard Bentley, in 1700, became master of Trinity College, Cambridge, he found that the custom was to examine candidates for fellowships (and scholarships) in the chapel *viva voce* before the master and senior fellows. Wordsworth reprints (*ibid.*, p. 348), the earliest Trinity College Cambridge examination papers he has seen, which included questions historical, geographical, and grammatical (three separate papers). He also summarizes the views of Dr. Richard Davies, late fellow of Queen's College, Cambridge, as given in his *General State of Education in the Universities* (1749), in which Davies proposed to abolish " close " fellowships and scholarships, to terminate fellowships ten years after the first degree, and to sequestrate sufficient fellowships to provide for at least fifty professorships in each university, to be remunerated, in part, according to the attendance of pupils.

In the eighteenth century, and even in the nineteenth century, fellows once on the foundation remained on it for life without performing any services, and often were perpetual absentees from their colleges. After University Commissions in 1850 and 1877, new statutes were drawn up for the colleges, taking away, ordinarily, restrictions as to place of birth and relationship to founders, etc., and limiting the tenure of ordinary fellowships usually in Cambridge to six years and in Oxford to seven years. The conditions of election vary in the two universities, and in the different colleges of each university. For instance, at St. John's College, Cambridge, under the statutes of 1882, celibacy is no longer imposed as a condition. The length of tenure is six years. The emolument is about £200 a year to each fellow. The number of fellowships is fifty-six, of which five are reserved as professorial fellowships, about thirty are tenable in conjunction and in addition to their salaries as holders of college offices, *e.g.* bursar, tutors, etc., and at least twenty-two are available as ordinary fellowships. The election is vested in the council (viz. the master together with twelve fellows of at least three years' standing from their first degree, who shall be elected from time to time by the master and fellows of the college), who may call in other fellows or outsiders, to help to ascertain the qualifications and proficiency of the candidates. The electors, severally, must make the declaration: " I do solemnly declare that I will vote for that person who is, in my judgment, the most fit to be a fellow of the college, as a place of education, religion, learning, and research." The five professorial fellowships at St. John's College, Cambridge, are reserved as additional emoluments to professors of the University of Cambridge, and are in addition to the fellowships, which are bestowed on holders of official positions in the college, who do not vacate their fellowships by lapse of time. A fellow, at St. John's College, who has served the college for twenty years in some official position, may, under provisions specified, hold his fellowship for life. The fellows of a college in Cambridge are ordinarily chosen from amongst graduates of that college, but the electors usually have power to elect a graduate from any other college in the university, and generally from any college in either the university of Cambridge or Oxford. In Cambridge colleges the election to fellowships is ordinarily made without any further special examination *ad hoc*, though the contrary practice prevails at Oxford, where graduates of one college may try for fellowships at other colleges, and present themselves for fellowship examinations either in their own or in almost any other Oxford college. At Peterhouse, Cambridge, the statutes give power to elect to one fellowship, or more, a person " eminent for science or learning," whether a graduate of Cambridge or Oxford, or not. At Gonville and Caius College, Cambridge, it is explicitly stated that the governing body has power, in electing a fellow, to attach any special condition to the tenure of his fellowship, which may seem to them desirable in the interests of the college. In the past fellowships have been held free from any specified or even implied obligation to conduct any special research, or to teach, or to write a book. The college was a corporation taking steps to provide for its perpetual continuance, through a succession of fellows. It insisted on an atmosphere of loyalty to all the traditions of the foundation and its developments, and relied upon the exercise of general personal influence rather than any literary output. The development of scholarship, though not explicitly demanded, became part of the tradition, and any dignified and outstanding work done by a fellow was welcomed as adding to the wealth of the college tradition.

But, notwithstanding the great variety in the conditions of award, the unanimous tendency in the colleges of both universities now is to award ordinary fellowships on and for research work, and not merely as prizes for good academic work. There is an implicit undertaking on the part of fellows to promote in some real, though not usually defined way, the advancement of learning. There is, sometimes, the explicit understanding that the elected fellow " continue to promote his researching " in some definite study.

In the Oxford colleges fellowships are usually awarded after a competitive examination, and, as already stated, candidates are received ordinarily at different colleges from that of which they have been members as undergraduates. All Souls' College at Oxford is a college in which there are no undergraduates, so that it consists solely of a warden and fellows, with two chaplains and clerks. Provision is made for forty fellowships in all, some open, and some reserved for special purposes. At Magdalen College, Oxford, the fellowships (by the statutes of 1882) are to number not less than thirty nor more than forty, under the same conditions as All Souls'. In addition to the college fellowships, there are at Oxford two Craven university fellowships and three Radcliffe traveling fellowships. For the Craven election may be made with or without examination. The fellowship is tenable for two years, and eight months of each year of tenure must be spent abroad in study in some place approved by the electing board. The Radcliffe traveling fellowships are awarded to encourage the study of medical science, and the fellows are required to study abroad.

The newer universities in Great Britain, Manchester, Liverpool, Birmingham, Leeds, Sheffield, and the University of Wales, all have fellowships, usually of the value of from £100 to £150 a year, awarded to recent distinguished graduates to undertake special specified research work, in Great Britain or abroad, for one, two, or three years. In these awards statement of the proposed subject of research is made by each candidate, and the pursuit of the research is obligatory on the elected fellow, in the place (at home or abroad) agreed upon by the electing board of the university and himself.

In the Scotch universities there are many fellowships, with many varied conditions, all or nearly all awarded on examinations *ad hoc*, or on dissertations, or on both. They are usually tenable for three or four years, and vary in value from about £80 to £200 a year. In the Shaw Fellowship in Mental Philosophy in the University of Edinburgh, the holder may be required in the fourth or fifth year of tenure to deliver a course of four lectures in that university, though graduates of any Scotch university may compete for the fellowship.

In the University of Dublin (founded 1791) the conditions for fellowships were founded, originally, on the usage of Trinity College, Cambridge. There is a Provost and seven senior fellows, in whose hands chiefly is the administrative side of the college. There are twenty-six junior fellows, of whom fifteen are tutor fellows. Junior fellowships are awarded on examination. There are no conditions of research imposed, but in course of time they ordinarily lead up to tutorships, if the fellow remains in the college. The senior fellowships are chosen from the junior fellows, and the offices, which are conjoint, are valuable appointments. In the new Royal University of Ireland junior fellowships are of the value of £200 a year, for four years, in which no teaching must be undertaken. They are awarded often amongst graduates of two years' standing.

J. E. G. de M.

See Exhibitions; Scholarships.

United States. — In the United States a fellowship is now an appointment ordinarily, for a single year, carrying a stipend to enable a student to complete the requirements for the Ph.D. degree, or less frequently for advanced professional work. It is not, as it still is in England, a more or less permanent title, and the fellow here has no voice in the government of the institution. Traces of the older meaning may still be found; for example, the corporate title of Harvard University is "The President and Fellows of Harvard College."

The first American fellowship, in the present sense of the word, was the Macy fellowship established in 1865 at Yale. This was followed in 1868 by the Harris fellowship at Harvard. The real beginning of the fellowship system, however, came in 1876, when twenty university fellowships were established at Johns Hopkins, each bearing a stipend of $500, less tuition.

The establishment of a fellowship has become a favorite form of bequest or memorial gift, partly because there are comparatively few permanent uses for funds too small to endow professorships or erect buildings.

The present development of the system may be seen from a report, made in 1906 by President G. Stanley Hall of Clark University, regarding the fellowships and scholarships available in the institutions, at that time members of the Association of American Universities; California, Catholic, Chicago, Clark, Columbia, Cornell, Harvard, Johns Hopkins, Michigan, Pennsylvania, Princeton, Stanford, Virginia, Wisconsin, Yale. Of these, Stanford has no fellowships. The others give a fairly accurate picture of the conditions throughout the United States, though it must be remembered that most of the more richly endowed and supported institutions are included in this list.

The distinction between fellowships and scholarships is very confused, and the conditions of award and tenure are far from uniform. In many cases this is due to the technical wording of bequests. In the following statistics any appointment of an annual value of $350 plus tuition charges, if any, has been included among the fellowships, and any appointment with a smaller stipend among the scholarships. Bringing President Hall's figures up to the year 1911, the total number of fellowships in these thirteen institutions is 272, of a total annual value of $139,250, about half of which comes from special fellowship endowments and half from general university funds. The total number of graduate scholarships exceeds 400.

The total annual appropriation for fellowships and scholarships, including the scholarships available in the professional schools and in the undergraduate college, makes no inconsiderable item in the university budgets. At Harvard and Columbia it amounts to more than $100,000 per annum.

The fellowships range in annual value from $100 to nearly $1500, the stipend of the Johnston appointments at Johns Hopkins. The normal stipend is perhaps $500. In endowed institutions where tuition fees are charged, the amount is naturally higher than in the state institutions where tuition is free, and the fellowships in the city universities, with their high living expenses, are likely to be larger than those in the rural institutions. Nowhere is there found as elaborate or as highly endowed a system as that for the Rhodes scholarships, which, so far as the American scholars are concerned, is practically a fellowship system.

The figures given above do not give the total aid rendered in these institutions to candidates for the doctor's degree. It is usually tacitly understood that assistants are to devote a considerable portion of their time to graduate work, for which no tuition fee is charged. Advanced work is also done under grants from the Carnegie Institution and other similar endowments, or in separate institutions, such as the Rockefeller Institute. Men on permanent appointment in smaller institutions, too, are often given leave of absence on half pay to enable them to complete the work for the doctor's degree at one of the universities.

Appointments to university fellowships and graduate scholarships are announced publicly, and the appointment is regarded as part of the academic *vita* of the incumbent. Provision is always made for a student of high academic promise who does not need financial aid, to retain the title while waiving the stipend.

Of the 272 fellowships cited above, 58 only are limited to the graduates of any particular institution. Classified in another way, about one third of the fellowships are attached to specific departments or divisions of study, and two thirds are not so restricted. In the latter case there is ordinarily an informal distribution in order that no group may be left entirely without a representative. The limited appointments are ordinarily in fellowships provided by special endowment, and the unlimited in those supported from the general university funds.

In a few cases it is stipulated that the incumbent shall study abroad, and in many others he may do so by special permission. The number of Americans, however, who wish to study in Europe for a full year or longer is decreasing, and a considerable number of these obtain Rhodes scholarships.

There are many interesting individual endowments, for example, a fellowship in American archæology at the newly founded University of Mexico. Several of the large chemical and other industrial corporations maintain research fellowships. This type of fellowship has been particularly developed at the universities of Michigan, Kansas, and Pittsburg. At Illinois there are ten $500 fellowships in experimental engineering. At Amherst college there is an interesting endowment known as the Kellogg fellowship, tenable for seven years, the first three to be spent at a German university and the last four as a lecturer at Amherst.

Whether a fellow shall devote his entire time to study is a moot question. At Columbia this is insisted upon. At Harvard, on the other hand, there are thirty teaching fellowships, and at Wisconsin a teaching fellowship is attached to each important state high school, the incumbent receiving $225 from the university and $100 from the school.

There is a growing feeling that under present circumstances the providing of fellowships is overdone, and that teaching, like the ministry, is harmed rather than promoted by paying mediocre men to enter it as a profession. "It takes more energy to stop studying and go at something else, than to go on studying. Many of our graduate students have no other momentum than this inertia" (Slosson). Careful organization for student employment at the stronger universities and the many loan funds have certainly lessened the need for direct aid. The weight of academic opinion, however, is still in favor of retaining the fellowships and scholarships now open. The list of the Johns Hopkins fellows, with its high percentage of names distinguished in American scholarship, is often cited by the supporters of the present system.

One very general weakness in the system, particularly among the endowed universities, is the inadequate provision made for women. Most fellowships were established before women entered graduate work in large numbers, and the regulations have not been modified to meet the changed conditions of to-day.

With this exception, careful provision is generally made for the judicious award of fellowships through previous written application and reference to departments and committees. Uniform dates for application, notification, and acceptance are now set by most of the members of the Association of American Universities, to prevent the candidate from playing one university against another and from breaking his agreement should a later and more desirable appointment come to him. In the stronger universities the applications are so numerous, and the difficulty of getting real information about a stranger so great, that practically all appointments go to men already in residence, and, therefore, personally known. The scholarships are counted upon to get in new blood. F. P. K.

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FELSTED SCHOOL. — See Grammar Schools, English; College; Colleges, English; Public Schools.

FELTON, CORNELIUS CONWAY (1807–1862). — Nineteenth president of Harvard College; was born at West Newbury, Mass., Nov. 5, 1807, and was educated at the Franklin Academy and at Harvard College, graduating at the latter institution in the class of 1827. He was three years tutor at Harvard, twenty-eight years professor of Greek, and president of the college from 1860 to 1862. Author of eight Greek textbooks, a history of Greece, and educational articles on the value of the study of Greek.

W. S. M.

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FEMALE EDUCATION. — See Coeducation; Coeducation, Hygiene of; Girls, Education of; Women, Higher Education of.

FEMALE TEACHERS. — See Teachers, Men and Women.

FENCING. — One of the oldest forms of exercise used in the physical education of the young. In the form of sword play, it constituted an important branch in the education of the young knights. Fencing is the national sport of the French people, as cricket is the sport of the English and baseball the national sport of America. The sword play of the Middle Ages was practiced with heavy weapons, the fencer holding the sword in one hand

and a shield in the other. During the nineteenth century, the art of fencing was greatly developed; the heavy sword was replaced by several lighter, weapons, as follows: the sabre or broadsword, similar to the old sword, only lighter the foil, the dueling sword, and the baton or singlestick. The foil is the weapon most extensively used to-day by those who indulge in fencing as a sport. It is not a real weapon, in that it is not used either in war or in dueling. The light saber, dueling sword, and singlestick are also used to some extent by amateurs of fencing as a sport.

As an exercise, fencing is especially valuable for developing good carriage, grace of movement, agility, and the ability to think and act quickly. In addition to these important physical accomplishments, there are definite ethical and social qualities fostered by this sport. The traditions of chivalry and courtesy always associated with fencing give it the distinction of being *par excellence* the sport of gentlemen. Fencing is the only combative sport adapted to girls and women. The graceful positions and movements characteristic of this exercise, and the polite and gracious formulas exchanged by the contestants, make it particularly attractive to women.

In the United States, the men's colleges have held annual competitions for the intercollegiate fencing championships since about 1890. More recently the women's colleges have taken up the sport with enthusiasm. The best results are obtained from individual instruction, but some teachers have succeeded in teaching the elementary movements of lunging, simple attacks, and parries to large classes arranged in double lines. G. L. M.

FÉNELON, FRANCOIS DE SALIGNAC DE LAMOTHE (1651–1715). — French prelate and author. While director of the institution of the *Nouvelles Catholiques*, founded for young women converted from Protestantism, he wrote his *Éducation des Filles* (1687) for the Duchess de Beauvillier. This work is one of the earliest attempts at a systematic discussion of the education of girls, which the author claimed had been too long neglected. The main thesis is that "women are weak, but must be strengthened for duties that lie at the foundation of all human life." It is their moral influence as mothers and homemakers that gives importance to their education. Fénelon takes up the position that there is much that they cannot learn, but in addition to a deep religious training, girls should be taught reading, writing, and arithmetic, music and painting, for the cultivation of taste, and the management of homes, economy, neatness, and order. Much in this work, however, is of general application to the upbringing and education of children. His chief works of a pedagogical character were written as a result of his appointment (1689) as preceptor of the young dukes of Burgundy, Anjou, and Berry, grandsons of Louis XIV. These were: *Recueil des fables composées pour l'éducation de Mgr. le Duc de Bourgogne; Dialogues des Morts;* and *Télémaque* (1697–1698). Fénelon's constant efforts to "diversify" instruction, which were indisputably for the purpose of relieving the pupil of effort and of making his studies attractive and easy, are evidence of a conception of the place of interest, of a poor type perhaps, in instruction, his theory being that "everything that delights the fancy facilitates study." He was a stanch supporter of public education, contending that the children belonged less to their parents than to the State, and that they should therefore be educated at public expense. For editions of his complete works, see Gasselin et Caron (34 vols., Paris, 1820–1830), and Leclère (38 vols. Paris, 1827–1830). For portrait see opp. p. 307.

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FERMAT, PIERRE DE (1601–1665). — A famous French mathematician. He was born at Montauban in 1601, and died at Castres, Jan. 12, 1665. He was a public official at Toulouse, mathematics merely occupying his leisure time. He published only a few papers, but he left a mass of notes that show a remarkable genius in the field of the theory of numbers (*q.v.*). He prepared an edition of Diophantus (*q.v.*). It is probable that he had, in his own mind, worked out some of the principles of analytic geometry (*q.v.*) before Descartes published *La géométrie* (1637), but he published nothing upon the subject and he destroyed some of his original manuscript, before his death. With Pascal he laid the foundation for the theory of probabilities. One of his best-known theorems is that no integral values of x, y, z can be found to satisfy the equation $x^n + y^n = z^n$ if n is an integer greater than 2. This has never been proved, and at present there is a large fund awaiting the one who shall demonstrate it to the satisfaction of the University of Göttingen. D. E. S.

FERRAR, NICHOLAS (1592–1637).— Founder of an Anglican community at Little Gidding. He went to school at four, and at five could repeat a daily chapter in the Bible. In 1606 he went to Clare Hall, Cambridge, took his B.A. in 1610, and remained three years further as fellow. From 1613 to 1618 he traveled and studied in Germany and Italy. On his return he was active in connection with the Virginia Company, and on its failure determined to retire with his relatives, to the number of forty, to Little Gidding, where the community lived on a plan organized by Ferrar. Next after the church, the school occupied his attention. An ancient dovehouse was enlarged into a handsome schoolhouse, and permission was given to children from neighboring parishes to attend. They were taught, without fees, reading, grammar, writing, arithmetic, and music, and the principles of the Christian religion, the pupils spending part of the day " in perfecting their harmonies in the scripture or getting it by heart. Some of them exercised their diligence in gilding and binding of books, and for that purpose Ferrar entertained a Cambridge book-binder's daughter to show them that piece of skill." Three masters were engaged to teach English, music, and writing. Ferrar himself took a personal interest in the school, and saw good order observed. The children were always occupied, a definite timetable being allotted and including physical recreation. Ferrar gave the religious instruction himself, sometimes devoting several hours daily to it. On Sunday Ferrar examined the children from neighboring houses. For every psalm which they could say perfectly each child received a psalter and a penny, and his Sunday dinner. Sometimes these were forty or fifty in number. For the adult members of the family morning and evening devotions were prescribed, and social service was done among the country people of the neighborhood. F. W.

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FERRARA, UNIVERSITY OF, ITALY. — An institution founded in 1391 through the efforts of the Marquis Alberto V of Este, who secured a bull from Pope Boniface IX. Schools had, however, existed in most of the faculties before this date. The bull established a *Studium Generale.* The maintenance of the university fell on the municipality, which found the burden too heavy in 1394, and allowed the university to decline. An effort to revive the institution in 1402 met with no greater success until 1430, when John de Fivotis was invited with his students from Bologna, and at the same time Guarino de Verona lectured at Ferrara. From 1442 on, the university made rapid progress. Ariosto and Savonarola were connected with it. Its reputation in the fifteenth and sixteenth century rested on its medical faculty, although it was also notorious for cheap degrees. At the end of the eighteenth century the long period of decline culminated in the closing of the institution. In 1815 a new university was organized, with four faculties, theology, law, medicine, and mathematics, to which an engineering school was added in 1824. The theological faculty has been dropped. In 1860 the institution became a free university. The municipal authorities of Ferrara are intimately connected with the administration of their local university. The enrollment in 1909–1910 was 409, the majority of students being in the faculty of law.

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FERRER, FRANCISCO Y. GUARDIA (1869–1909). — Spanish educator, and founder of the Modern School (*q.v.*) at Barcelona. His career will always arouse the interest, and, it may be, the passions of mankind. The tragic termination of his life in the trenches of Montjuich (Oct. 13, 1909) left the world outside divided into two hostile camps, — the one composed of those who see in Ferrer the incendiary and the insurrectionist, and the other of those who venerate him as the rationalist educator martyred at the hands of the obscurantists.

The political controversies centering in the personality of Ferrer are necessarily foreign to our immediate purpose. This article will only deal with the part he played as an educational publisher and innovator, and his contribution to pedagogy in the foundation of the Escuela Moderna.

The circumstances leading to this epoch-marking event — related by Ferrer himself (see his article in *España Nueva,* June 16, 1906), are unfortunately too long for mention here. Suffice it to say that the realization of his plan of " education based solely on the natural sciences " was made possible by the material resources secured to him by certain dispositions in his favor made in the will, dated Jan. 20, 1901, of a rich pupil of his, Mademoiselle Menier. The original in French is deposited at Milan (Giacomo Galli, Notary, No. $\frac{5090}{2273}$). The lady died the same year, and Ferrer thereupon entered in possession of his heritage. This legacy secured him an annual revenue of some 36,000 francs. He raised large sums of money — a total of 450,000 francs — by mortgage on this property, and considerably increased his fortune by successful speculations. The money thus acquired he always treated as an instrument for modifying by dint of education the mental ideas of his countrymen. A system of education on rationalistic lines was the challenge he threw into the camp of clericalism and illiteracy in Spain. (See Spain, Education in.)

In his early days, Ferrer had been an ardent revolutionist, but, to quote his own language, " When Zorrilla died (1895) I lost all my confidence, which had been already much weakened, in the results of a revolution effected by superficial revolutionaries. . . . From that time forward I devoted all my activity to the task of establishing a school, which, in my humble opinion, might serve as a model for all the schools which advanced bodies were endeavoring to found in order to preserve the child from the mendacious teaching of the official schools." That was, he adds, "the origin of the Modern School."

Those who best knew Ferrer in those early days confirm the foregoing statement as to his almost fanatical faith in the socially transforming power of education. He believed that the only means of realizing what is good is to teach it by education and propagate it by example. Whether Ferrer's view is sound is an open question, but there can be no doubt that his conduct throughout the last decade and a half of his life was consistent with the doctrine as above set forth. Clearly any other line of policy was dangerous to his cherished ideals, and would have involved the ruin of his fortune, besides wrecking his flourishing business, the stability of a wide network of rationalist schools, and the scholastic future of some 10,000 scholars. (This was the estimated number attending the one hundred schools or thereabouts, at their closure in 1909.) Had he been a vulgar assassin or chief of a revolution, as his enemies declared, he surely would not have hampered his subversive operations with the tedious organization of a network of rationalist schools and the launching of a big series of pedagogic publications. His publishing stock of 115,000 copies of his books was seized by the government when his property was sequestered.

In the eight years from 1901 to 1909, during which there was a thirteen months' interregnum of inactivity, June, 1906–July, 1907, owing to Ferrer's imprisonment awaiting trial at Madrid, the record of Ferrer's publishing output included the issue of forty volumes of educational manuals. These embraced three volumes of *Universal History* (Jacquinet); *Spanish History* (Estevanez); *The First Ages of Humanity* (Professor Engerrand); *Super-organic Evolution* (Professor Lluria: prologue by Ramon y Cajal); a series of six volumes by Dr. Odón de Buén, viz. *Physical Geography* (prefaced by Réclus), *Natural History* (2 vols.), *Mineralogy, The Stone Record, The Ages of the Earth; Ethnic Psychology* (Dr. Charles Letourneau, 4 vols.); three volumes of Spanish and French grammar; two volumes of choice extracts printed in varied types of handwriting, published as graduated school exercises in the reading of script; etc. These books, excellently printed and well bound, were sold at two pesetas each (40 cents) and found a profitable market, not only with the general reading public in Spain, but with the founders, professors, and pupils of the one hundred schools ultimately formed on the plan of the Escuela Moderna. The Supreme Council of Bishops of the Independent (Catholic) Church of the Philippine Islands formally adopted seven of these manuals as textbooks in their seminaries and schools. (See Bishop Aglipay's letter in Ferrer's *Boletin*, June, 1909.)

In addition, he edited a continuous monthly series (October, 1901, to July, 1909) of educational *Boletines* in which the proceedings of the Escuela Moderna are recorded. The *Boletin* contained articles by men like Letourneau, Anselmo Lorenzo, Zola, Haeckel, Flammarion, Elisée Réclus, Berthelot, Naquet, Kropotkine, Odón de Buén, Ferdinand Buisson, etc. He also issued at Brussels an educational review, *L'Ecole renovée* (monthly, April to November, 1908) principally devoted to the theoretical exposition and discussion of the doctrines of the Escuela Moderna, and of the International League for the Rational Education of Children, of which Ferrer was president, and Professors Haeckel and Sergi, two vice-presidents. The second volume of this review (Paris), issued weekly from Jan. 23 to July, 1909, was almost exclusively occupied with the practical problems of pedagogy.

Ferrer was stricken down when his work was taking new and yet more serious flights of constructive activity. For months prior to his death, he was engaged in launching a new *Encyclopedia of Popular Teaching*, to consist of fifteen volumes, ranging from *The Evolution of Worlds* (Vol. I), the *History of Civilization* (Vol. VIII); the *Evolution of Technics and Art* (Vol. XIII) to *Man and the World* (Vol. XV). He was busy preparing his *éditions de luxe*, illustrated with engravings by the renowned artist, Kupka, of *Man and the Earth* (Réclus), and the *Great Revolution* (Kropotkine). The first announcements of these works appear in his *Boletin*, dated February, 1909, and are continued month by month till the last issue dropped from his hands in the fatal July days. The will, dictated by Ferrer a few hours before his death, charged his testamentary executors (one of whom is the present writer) with the duty of publishing certain of these works, together with five books (amongst them two by F. J. Gould) of the Moral Instruction League (London). These books he had but lately taken home from England, and was studying and annotating them at Barcelona for publication, when the insurrection submerged his labors in the rising tide of clericalist reaction. (See extract from his letter to the present writer, cited by William Archer in *McClure's Magazine*, November, 1910.)

Ferrer's work is for the time being arrested, but the spirit of Ferrer is still alive in his native Spain, and may at any moment embody itself in a revival of the ideas and institutions of the Escuela Moderna. W. H.

See Modern School.

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FERRIS, ISAAC (1798-1873). — College president; graduated at Columbia College in 1816. He was instructor in the Albany Academy; organized the Rutgers Female Institute, and was its first president (1839–1852), and was president of New York University from 1852 to 1870. Author of *Domestic Christian Education* (1835). W. S. M.

FERRY, JULES FRANÇOIS CAMILLE (1832–1893). — French statseman. Minister of Public Instruction, 1879–1880; and again in 1882. It was during his incumbency that the great fundamental laws which form the basis of the French system of primary education were passed. Religious instruction was banished from the schools; education was made compulsory between the ages of six and thirteen; and instruction in all grades of the primary (or elementary) schools was made gratuitous. The marvelous educational activity of the time is still further evidenced by the requirement that each department should provide adequate normal training for its elementary teachers; two higher normal schools, one for men and the other for women, were founded to supply the teaching force of the departmental normal schools; and state education for girls became a reality, first by the establishment of a system of lycées and colleges for young women, and secondly by the creation of a higher normal school to train the teachers for these lower schools. In all these great movements Jules Ferry played a leading part.

F. E. F.

See France, Education in.

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FERULE IN EDUCATION. — See Punishment, Corporal.

FESTIVALS, SCHOOL. — It is impossible to draw the line between the more formal type of school celebration and the school festival, understood as implying something of festal gayety and display. For decades, and indeed it may be said for centuries, schools have had celebrations of the formal type, such as Speech Day, or Prize Day, in the schools of England and the academies of New England, the presentations of Latin plays such as the famous Westminster plays (for which see article on Drama and Education), the graduation or commencement exercises of public and private schools, Founders' Days, and other commemorative occasions. As a rule these academic exercises have had little of the festal spirit; they have been formal and sober, and scarcely fall under the category of festivals as the term is used here.

It was Ruskin in more recent times who helped more than any one else to enlarge the scope and develop the picturesqueness and festal quality of school commemorations. The May Day celebration, with its return to the old folk ceremony of choosing and crowning the May queen, which he succeeded in getting introduced into some of the schools of England, may serve to mark the adaptation of the old folk festival of the Maying to a school festival; and the fact is indicative of the reason why of late years school festivals of this type have tended to multiply. The old folk celebrations have declined and often faded from memory; and those who have either recalled them or have realized what a valuable element has passed away from our modern civilization, have endeavored to revive them through the school and bring back into the lives of the young, at least, their charming gayety. In New England, for various reasons, festal celebrations have never found much favor. The Puritans left all such fripperies behind them when they crossed in the *Mayflower*. In old England they have never quite died out, more especially in some of the more remote country districts; but that they have ceased to play any general part in the lives of the people and the children in large cities is evidenced by the recent "revivals" of one sort and another, such as the revival of morris dancing, popular games, ballads, and pageants. In former days, when the major festivals of the year were celebrated socially and domestically, their celebration in the schools was unnecessary. Christmas and New Year, Twelfth Night and Candlemas, Valentine's Day, May Day, Michaelmas Day, Harvest Thanksgiving, and Guy Fawkes Day were commonly celebrated by the community, in the social circle and the home; and, in the case of religious festivals, by the church, and more recently by the Sunday school. The occasions were generally observed as school holidays. But times altered. Under the busier industrial order which has changed the ways of Merrie England (not to mention other countries) the folk, now become wage workers, have had little time for holidays and the cultivation of the old folk arts; and so the old revels, the songs and dances, the mummings and the pageantry have gone.

May Day Festival in a Public Park, Buffalo, N.Y.

May Day Festival in Van Cortlandt Park, New York City.

SCHOOL FESTIVALS.

The school festival may, then, be regarded as primarily an attempt to revive in and through the school (or other educational agencies, such as the settlement and playground association) the spirit and the folk art of these old festivals, — so rich in symbolism and ritual. The eagerness with which this may be done is to be measured by one's estimate of the cultural and pedagogical values which reside in such festival celebrations. That the festival may be an instrument of culture need scarcely be argued: one has but to recall the festivals and pageants which were such a vital form of popular art in the Middle Ages. That it is a form of culture sadly needed among us in America is obvious when we think of our ways of celebrating Independence Day (the Fourth of July) and New Year's Eve, for example, which, instead of being mere orgies of noise and feasting, might have some suggestive and poetic quality appropriate to the occasion. As examples of banality certain college commencements attain high rank.

In order that the school festival may be regarded as an important pedagogical instrument, it is necessary to raise it to the dignity of a regular part of the work of the school. Hitherto, the school exercises as those which have been held on occasions like Washington's Birthday, Arbor Day, and Independence Day, have been " extras " which have involved much hard labor on the part of the teachers, and rehearsals out of school hours by the pupils. They have commonly lacked the essential elements of the festival, namely, joy and spontaneity. These elements cannot be secured unless the requisite aptitudes are consistently developed by steady work in declamation, dramatization, singing, and dancing in the classroom, gymnasium, and assembly hall. This means that these subjects are to be recognized as important parts of the school curriculum, and not as mere " fads and frills "; and that the time spent in occasional coördinations of the work done in each for the purpose of festival productions is time well spent, and worthy of being provided for in the time-table. The work of preparation, instead of being a burden and an extra, must be legitimate and leisurely work, justified by reason of the educational values which it yields.

That there are such educational values those who have handled the school festival from this point of view testify abundantly. The evidence to be cited here drawn from the experience and practice of an institution where, for many years, systematic endeavor has been made to develop the festival as an integral part of school work, namely, the Ethical Culture School of New York City. Here the festival has been regarded as a means of preparing the young for life, — not only the life of work, but the life of leisure and recreation. There is a return to the Greek idea of the double function of education, that it shall prepare for refining leisure as well as for citizenship. The deliberate endeavor to educate for leisure may be justified to-day in view of the increasing difficulty which the worker, the craftsman, or the business man finds in obtaining any generous development, through his minutely subdivided work, and in view of the further fact that the people of to-day have lost the old art of social self-amusement. They are merely passive in the hands of the box office and the caterer. The same is equally true of the children of to-day; they, too, have lost the old arts of childish play and recreation, and must actually be taught to play effectively and wholesomely. The school festival not only teaches the young how to play or recreate themselves through participation in the fine arts of story telling (by mimicry and dramatization), song, dance, ceremonial, — but helps to form and standardize the taste toward the enlightened patronage of the theater and the vaudeville, the concert and opera, and of course the literary expression of these in the printed song, story, and play.

Supplementing these larger social and educational justifications for the festival as a school institution, further pedagogical reasons may be cited. First, the festival properly conducted is the most vital way of coördinating a majority of the subjects studied in the school, — English literature and composition, music, art, dancing, domestic art, shop work, and foreign languages. It is worth while to devote a fortnight or a month every year or every other year to a piece of intensive work in real coördination. Whether the play or pageant represented is composed by the pupils as part of their regular work in English, or whether it consists of some classic or standard play, such, for example, as one of Shakespeare's plays, studied in the high school, the work of the class or classes engaged is work which has not only the normal value of the regular work, but the added value which comes of deepened interest and delight; it is brought to the glowing point, and its effect lasts for years. The music required for the festival is readily incorporated in the regular class work by any cultivated music teacher worthy of his hire. The same is true of the art work involved in the preparation of scenery, stage settings, decorations, and programs needed for the occasion. Only a pedant will be blind to his exceptional opportunity to produce real art. The dances, which must find an important place in any festival, may by a skillful teacher of gymnastics or physical culture be adaptations of work prescribed for the pupils. The costuming will be taken care of in one or more of the sewing and dressmaking classes, if possible by the actors; but if they are too small, a high school group may be asked to function. The stage properties will be provided by the class as a project in shop work. Foreign languages may be involved by the selection occasionally of plays or parts of plays in French and German, or even, for high school purposes, in Latin and Greek. The problem involved in effecting this coördination of school activities reduces itself to a problem (not an easy one, it may be said) of school organization.

In the second place, the festival is a means of emphasizing and maintaining the right method of dealing with the subject which is central in festival production, that is, English. It emphasizes the fundamental significance of the oral method, and the fact commonly lost sight of, that literature is fundamentally oral and auditory. The principle which should be uppermost in the teaching of literature is that which requires that each species of literature should be treated according to its kind: singable songs should be sung, stories should be quite frequently recited or enacted after the manner of the genuine story teller, and plays should ordinarily be presented dramatically, as they were intended to be by those who wrote them. Thus the festival becomes a means toward that reform in English studies which is being pressed for by the more eager and alert teachers in our schools.

Further reasons may be summarily stated. For each of the subjects involved, festival work is one of the most effective methods of learning by doing; and for the young child it is a legitimate way of satisfying those fundamental dramatic or mimetic instincts which are natural to childhood. Again, it aids the discovery of special aptitudes in the pupils, as these are disclosed under the unusual demands and with that stimulation of the powers which the work involves. Lastly, the festival may be the most powerful means of fixing memorable events and personalities or great ideas in the heart and mind of the child; the drama of the seasons, with their parables of sowing and reaping, of springtime and harvest, of winter sleep and vernal resurrection; or the sacredness of citizenship in one's country and city; or the achievements of the makers of destiny, our heroes, national and local, as well as of the dominating figures of universal history.

The difficulties in the way of organizing festivals with these ends in view are considerable. The prime condition of success is that the various forms of festival activity shall be kept alive as part of the regular work of the school. This means that the children shall be in the habit of singing their songs as the natural daily expression of their innate lyric impulse; that, similarly, they shall be in the habit of giving dramatic expression to ideas and of reproducing the stories which have been told to them by means of gestural and dramatic representation — that being the method proper to children who, lacking words, resort to the more fundamental method of mimicry. This is, after all, little more than a revival of the arts of childhood which in the past have been the child's most precious legacy; the great formative arts of play, — the songs and games, the dance drama and balladry of the children of the ages. The true literary nature of the child is revealed in these, and the educator ought to take his cue from them.

If, then, throughout the grades of the elementary school the children sing and dramatize, as they should, they are always in a condition to be called upon to produce at short notice any play or part of a pageant which may be arranged for by the teachers and faculty. They will act and sing naturally and spontaneously, with no touch of that staginess which so many people fear will be the result of dramatic work. There will be a constant supply of small recitals and plays, for school and class assemblies; the fruitions of regular work in literature, music, etc. A second condition of effective organization of festivals is that they shall be put into the hands of the classes or groups of classes in rotation, the particular festival, — for example, that of Washington's Birthday or Patriot's Day, — being assigned to those classes which are engaged in the study of material that lends itself to such a festival. The school as a whole will share in the festal spirit through the songs which are to punctuate the presentation.

Effective organization further implies that the plan of festivals for the year shall be agreed upon in advance by the school authorities, and that a festival committee composed of heads of departments shall be charged with the execution of the plans. The festivals may vary from year to year as to their number and the emphasis to be placed upon each. The greater festivals, such as Thanksgiving, Christmas, Washington's and Lincoln's Birthdays, which may be combined in a Patriot's Day festival, the spring or May Day festival, and the graduation festival, may be supplemented by many minor celebrations and commemorations according to the number of red-letter days in the calendar of the locality. There may be a City Day, which should be devoted, as is altogether too infrequently done, to the glorification of one's city or state. There may be a Shakespeare festival in April, a Founder's Day, or, where there are large groups of the different nationalities, a St. Patrick's or St. David's or St. George's festival. These minor festivals may take the place of an ordinary school assembly.

The material to be utilized may vary considerably. It may be the pupils' own dramatization of history material, such as the first Thanksgiving, with appropriate introduction of Indian life. It may be the dramatization of a story or an eventful career, such as *The Man Without a Country*, for Patriot's Day, or the story of Lincoln's life and times. It may be an original play worked out by the class to illustrate the central idea, including original songs (new words for old tunes) such as Christmas carols, many of which can no longer be used unaltered in a mixed community with a large Jewish element. Or the class may present some classic play, Shakespeare's *As You Like It*, or *A Midsummer Night's Dream*, for a spring festival; or a play in the classic manner, such as Robert Bridge's *Demeter*, for the Thanksgiving or harvest festival. Simple and worthy plays for children have so multiplied of recent years that there is now a considerable repertoire upon which schools may draw.

Perhaps the most easily handled festival is the type which may readily be given on May Day or at Christmas, in which a number of classes collaborate, each contributing to a varied program some one scene which will fit into a general scheme. Thus the May Day or spring festival may reproduce the varied features of the old English May Day celebration. One class may contribute the ceremony of the choosing and crowning of the May queen. Another class may contribute a band of Sherwood foresters, and enact episodes from the life of Robin Hood, such as those narrated in the Robin Hood ballads. Another class may form a group of peasants who dance the old morris or country dances for the entertainment of the queen; another, a group of maypole dancers. So, too, at Christmas there may be a composite of classes, each of which may reproduce some scene or some detachable fragment of a play which it has produced during the year, or an interpretative dance, or a fairy-story pantomime after the manner of the old English Christmas pantomime. In this way five classes of, say, one hundred and fifty children may present a charming pageant, marching into the hall with banners and insignia, singing each its appropriate song and contributing each in turn its item of a well-coördinated program.

The results to be accomplished by such development of the school festival may be briefly summarized as the development of the coöperative spirit and of team work among the classes, the discovery of aptitudes which are not evoked by the ordinary kind of class work, the preservation of dramatic naturalness and spontaneity on the part of children, the proper oral and dramatic treatment of literature, the quickening of the spirit of joy and refined delight, the education of children in the appreciation of simple and chaste amusement, the development of clear and pleasant speaking and of good manners, and, finally, the stocking of the children with a body of song and poetry which they will probably never forget. Here a final word should be said as to the connection to be made between the development of the festival in the school and the development of the festal spirit in the home and the community. In a school in which the festival performances are regular, the children learn ways of refining self-amusement which they can carry into the home. They have songs to sing and games to play, and a ritual or ceremonial appropriate to the great festival occasions, which may have the effect of actually transforming the life of the home on such occasions. Their picnics and excursions, their vacation activities, may also be enriched in the same way. Thus it is that to work for the development of the festival in the school is to work for better ways of social recreation and for the revivification of the folk festival as a form of popular culture and entertainment.

The Recent Development of the Festival. — Many diverse and seemingly unrelated tendencies have led to the recent revival of the festival and the pageant in schools and colleges and outside of them. The quickened interest in folk art — folk song and story, folk balladry and dance, folk drama and folk festival — is one of these. Another closely allied tendency finds expression in the efforts of such organizations as the Ben Greet Players toward the revival of early drama, notably the miracle and mystery plays, under the simple conditions of the early English life which produced them, and the rendition of Shakespearean plays in the spirit of the Elizabethan epoch and without the paraphernalia of the modern theater. This tendency naturally connects itself with actual survivals of the old folk drama such as the Oberammergau Passion Play. To the same historic interest we may ascribe the numerous pageants on the occasion of important historic commemorations, the centennials of towns and cities, such, for example, as the great Warwick pageant, which was a genuine folk undertaking, involving the coöperative industry of the people of all classes in that little city on the Avon. The example thus set in England was followed here in historical pageants at Quebec, Champlain, Deerfield, Gloucester, and elsewhere. Yet another form of expressing the impulses of picturesque festival presentation is to be found in the development of the dance and play festival, in which some of the leading settlements and the recently formed playground associations have taken the initiative.

Returning to the first of these influences, it may be noted that there has been an ever-increasing number of presentations by universities, colleges, and schools of ancient dramas and Elizabethan plays, either for their own sake or as part of some larger festival. From a list of such presentations (see the Chicago *Dial* of Aug. 1, 1907) may be mentioned the production at Brown University of Marlowe's *Dr. Faustus*, and of *Ralph Roister Doister* at Tufts College in 1905; Harvard's production of Ben Jonson's *Silent Woman* in the same year, and Dekker's *Shoemaker's Holiday* in 1889; Tufts College's presentation of the *First Pageant of the Shepherds* in 1900, and Yale's production of the *Second Pageant* a little later. The University of Vermont, the Roxbury, Mass., High School, Butler College, Indiana, the University of Chicago, Wellesley College, likewise appear in the list. Bryn Mawr College must be mentioned here as representing another development of the festival idea in its now famous May Day revels, in which all the elements of the old English folk festival —

singing, dancing, mumming, ritual — are incorporated. (See DRAMA AND EDUCATION.)

Again, presentations of Greek plays have become more numerous, and have led to the erection of Greek theaters, such as the beautiful example at the University of California. Opportunities have also been provided for these and other forms of dramatic presentation by the erection of halls with suitable stage accommodations, and of large stadia for athletic displays, Olympic games, and miscellaneous festivals, such as those provided at Harvard and Tacoma.

The schools, too, have been developing new types of school festivals and improving such occasions as commencement by introducing, in the form of processions, ceremonies, and dramatic scenes, elements that for the first time have given a genuine festal spirit to these occasions. The training schools must also be included. The Boston Normal School celebrated the opening of its new buildings by giving a great Pageant of Education; the Brooklyn Training School for Teachers attempted something of the same sort, and Teachers College, New York, produced old English carolings and Christmas rites.

Finally must be instanced the dance festivals which have been given in the public parks in Chicago, New York, Pittsburg, and elsewhere, and have consisted of national dances contributed by people of different nationalities in our great cities. To these have been added dramatic presentations; thus on one of the Boston playgrounds the Greek myth of Prometheus was presented in pantomime and dance. The settlements have also given, either in small parks or in the closed street, little plays or pantomimes, such, for example, as the Robin Hood play, or mask, given by the Greenwich House in Jones Street, New York, the street being closed to traffic for the purpose.

This rapid survey would be incomplete without a reference to the many important attempts, in which children have for the most part participated, to transform the senseless and noisy celebration of the Fourth of July (Independence Day) into an occasion of interesting and picturesque commemoration, — "a safe and sane Fourth," as it has been styled. In Springfield, Mass., in particular, a great step forward has been taken in the direction of substituting, for the individual celebration of the occasion by the discharge of the firecracker, processions with floats representing historic episodes and personages, athletic contests, dances, etc. With Springfield, such cities as St. Paul and Pittsburg should be mentioned as leaders in this laudable enterprise. In some schools and localities a similar transformation of Hallowe'en, with its mischief, its destructive amusement, and its accidents, has been attempted.

We must not overlook the stream of tendency in this direction that has flowed steadily from the kindergarten. In many a school where there is no other form of festival, there is always something in the nature of pantomime and merry-making around the tree in the kindergarten. The theorists who have learned of Froebel and Pestalozzi have not been slow to seize upon the exemplification which the festival and all forms of dramatic work in the schools have made of the neglected motor element in the education of the young. It is now common in textbooks of pedagogy to find a plea made for the development of the dramatic instincts of the child as involving the most vital form of learning by doing. Teachers of the primary grades have come to see that the child's natural way of reproducing a story or illustrating an idea is not so much by word as by dramatic imitation. Hence the growing tendency to dramatize not only the reading lesson, but the history and the geography work of the class. The most striking outcome of this tendency is perhaps the quick multiplication of late of dramatic readers of all kinds, and of little collections of plays for children of all grades in the primary and grammar schools. That such work vivifies the child's interest in his studies has been abundantly demonstrated. That it impresses the mind as nothing else does is also clear. If further justification of the dramatic idea and method were needed, it might be found in the interesting history of the short-lived children's theater, conducted by Miss Herts at the Educational Alliance in New York City, the effect of which was to generate an unprecedented demand in the local libraries for the works of Shakespeare, Mrs. Burnett, Mark Twain, and others from which the material to be presented by the young players was drawn.

There can be little doubt that this recently developed attention to the importance of the dramatic element in education and recreation is no passing fad. The festival must win its way as an educational instrument. But the working out of festival undertakings must go forward steadily before any sustained effort can be made on a large scale by school children or groups of schools. An opportunity for the participation of school children in the great popular festival was offered at the time of the Hudson-Fulton celebration in New York City; but, with the exception of one or two groups of the public school children, the idea failed of fulfillment. Elaborate plans were carefully made by experts; but the politicians laid grasping hands upon them. Many possibilities are suggested by the pathetic May parties held every spring by groups of children from the poorer districts of New York in Central Park of that city. These await a transforming hand. Because it is a natural historic form of childish amusement and culture, which has found its place among the children during the long centuries of the past, the festival, as a combination of singing and dancing, marching and play-acting, will surely continue to grow in favor with educators, with the public and parents, and, above all, with children themselves. P. C.

See Drama and Education; Dancing; Play; Exhibitions, School; Special Days.

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FETTES COLLEGE. — See Grammar Schools, English; College; Colleges, English; Public Schools.

FEUDALISM. — See Chivalric Education.

FIBONACCI, LEONARDO, or LEONARDO OF PISA (*c.* 1175–*c.* 1250). — The best of the medieval mathematicians of Europe. He was born at Pisa during the period of that city's great commercial supremacy.

As a child Leonardo was taken by his father to Bugia, the modern Bougie and the Saldæ of the Romans, on the Algerian coast, and put to school under a learned Moor. As a consular agent of some kind, the father was in touch with the commerce of Pisa; and it was probably on this account that Leonardo was able to make his voyages about the Mediterranean. He visited Egypt, Syria, Greece, Sicily, and Provence, and became acquainted with the various arithmetical systems in use. All of these systems, he tells us, he counted as error compared with the Hindu arithmetic (*Quasi errorem computavi respectu modi Indorum*). He therefore composed an extensive treatise upon this subject, the *Liber Abaci*, which appeared in 1202. His revision of 1228 is extant, but no copy of the first manuscript is known. By this work Leonardo did much to make the Hindu-Arabic numerals (see Notation) known in Europe. He also wrote a work entitled *Liber quadratorum*, in which there is a considerable treatment of indeterminate equations; another entitled *Practica geometriae*, which includes some trigonometry; and one bearing the name of *Flos*, and treating of equations. He was evidently in touch with the learned men of his day, for he dedicates one of his works to his teacher, Michael Scot (*Scripsistis mihi, domine mi, magister Michael Scotti, summe philosophe, ut librum de numero, quemdudum composui, vobis transcriberem*). A statue of Leonardo may be seen in the Campo Santo at Pisa. His works were published by Prince Boncompagni under the title *Tre scritti inediti di Leonardo Pisano* (Florence, 1854; second edition, 1857), and *Scritti di Leonardo Pisano* (Rome, 1857). D. E. S.

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FICHTE, JOHANN GOTTLIEB (1762–1814). — The German philosopher; born in Rammenau, Upper Lusatia, May 19, 1762. He studied at the University of Jena, and then gained a precarious livelihood for several years by tutoring and by writing for magazines. At first he was a follower of Spinoza; but later his study of Kant revolutionized his philosophical thinking. In 1792 appeared his first book, *The Critique of All Revelation.* Published anonymously (through a mistake), it was hailed by the critics as a work of Kant himself; and when the authorship was announced, Fichte became famous. In 1794 he went to Jena as professor of philosophy, and at once became very popular. Four years later he severed his connection with the university, because of difficulties which grew out of the charge that his teachings were atheistic. For a short time he gave lectures on philosophy at the University of Erlangen, and later at Königsberg. When the University of Berlin was founded, he was one of its foremost professors, and he served as its second rector. He died in Berlin, Jan. 27, 1814. His chief works are *The Foundation of the Whole Science of Knowledge* (the *Wissenschaftslehre* of 1794), *The Foundation of Natural Rights*, *The Science of Morals*, *The Vocation of Man*, *The Way to the Blessed Life*, *Characteristics of the Present Age*, *Addresses to the German Nation*, and *The Facts of Consciousness*. His *Complete Works* appeared in eleven volumes (1834–1835 and 1845–1846), edited by his son, who also published his *Life and Literary Correspondence*.

The fundamental conception in Fichte's philosophy is that of the ideal. Man's life is a constant striving to realize the ideal of unity. The search for knowledge is an effort to make ourselves one with the object of knowledge. The life of the practical man is an attempt to bring an external object or another will into harmony with his own will. The artist is continually striving to make the sensuous material the vehicle for the expression of his artistic purposes. And the moral and spiritual life is the effort to bring into harmony the various conflicting impulses within the self. And just as the ideal of unity is the fundamental thing in our lives, so it is the deepest thing in the universe. The history of the world is, essentially, nothing but the process in which the ideal is gradually realizing itself. This self-realizing ideal or idea is what Fichte means by " God." He conceives of God, not as a personal consciousness, distinct from the world, but as the spiritual power whose self-expression *is* the world. The ideal is not a mere something which we fashion in imagination and then strive to make actual. On the contrary, it lives and strives in each one of us; it has fashioned us to be the vehicles of its self-expression. The world, then, is the life of God. God has no distinct consciousness apart from ours; he comes to self-consciousness in us. The more perfectly the ideal is realized in men, the more completely does God exist.

Fichte's idealistic theory of matter follows naturally from the principles just laid down. The material world is not something fundamentally unlike spirit. The history of the world is the effort of the idea to become fully conscious of itself and fully at one with itself. Now all that we call "consciousness" involves an element of opposition. The child becomes aware of himself in opposition to, and in distinction from, other things. Thus we cannot get a consciousness of self without a consciousness of a not-self, an external object. But the external object is not, as we naïvely suppose, utterly unlike our own mental life. Everything that you can say of it is in terms of consciousness. It is hard, round, red — what are these adjectives but names for certain experiences which you and others have? All reality, then, is conscious experience. The " external object " is simply the way in which we interpret an opposition in consciousness that we are striving to overcome. And just as conflict with material things is a means to the attainment of a richer consciousness, so conflict with other wills and final coming into harmony with them serves to deepen and enlarge our experience. This is why the ideal, which is ever struggling toward fuller self-realization, manifests itself in many individuals instead of one alone.

Human society should steadily progress toward perfect harmony of all men with one another, and toward complete mastery over the forces of nature. For this purpose it needs a clear understanding of the goal, of the degree of attainment, and of the means by which further progress may be made. It needs also wise men to guide its progress. There are two classes of scholars — the teacher and the pragmatic scholar. The function of the former is to give to his generation the understanding necessary for its progress and to train new scholars; that of the latter is to use the knowledge which he has attained in directly promoting social progress, *e.g.* in modeling legislation or in subduing the forces of nature. All those who have the direct guidance of human affairs should be scholars. Mere learning cannot make a scholar; the true scholar is one in whom the Divine Idea is a living power. All teachers, even in the lower schools, should be scholars, though not necessarily " finished scholars "; *i.e.* they should be filled with the love of knowledge and should be continually striving to enlarge their knowledge.

This conception of the function of the teacher is unfolded chiefly in *The Vocation of the Scholar* and *The Nature of the Scholar*. These two works and *The Addresses to the German Nation* contain Fichte's most important utterances on the subject of education. When Germany was prostrate at the feet of Napoleon, Fichte was one of the first to point out that her only hope lay in a complete reform of her educational system. In the powerful *Addresses to the German Nation*, delivered in Berlin in the year 1807–1808, he urged a thorough reorganization of the German school system along the lines indicated by Pestalozzi. While he criticized it in some respects, he believed that the Pestalozzian doctrine is in its essence correct. And his championship of it had much to do with the introduction of the new method into the Prussian schools. The chief suggestions of educational theory in the *Addresses* are the following. All real progress comes from the people; hence the whole people should be educated. Education is the function of the State. The children should be separated from their parents during the entire period of their training, at least until we have a generation of parents who have been brought up under the new methods. The two sexes should be educated together, and to a considerable degree should have the same education. All children should be trained to work with their hands; but Pestalozzi's suggestion that they do this work while they are studying is ill-advised. In the manual training, emphasis should be put upon agriculture, the care of animals, the mechanic arts, — in short, upon those occupations which the majority of the pupils must pursue in later life. Physical training should form part of the regular instruction; the methods should be devised by men who have a thorough knowledge of anatomy and also of psychological principles. In the mental training the chief aim should be, not to impart knowledge, but to develop mental activity and to arouse in the child the love of knowledge and the love for his fellow men. The ultimate end of all education is to develop a pure morality and the spirit of true religion. As to methods of mental training, some of Pestalozzi's theories are open to criticism. We should begin, he says, by giving the child a knowledge of its own body. Here he is wrong: education should begin by teaching the child to discriminate his various sensations. Another error that Pestalozzi makes is that he greatly overestimates the value of reading and writing, and would have the child acquire them very early. He falls into this mistake because his chief concern is to fit the children of the poor to earn their daily bread as quickly as possible. But the errors in his theory are only superficial; its fundamental principles are sound.

E. B. T.

See Portrait opp. p. 580.

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FICINO, MARSILIO (1433–1499). — Italian humanist; born at Figline, the son of the physician of Cosmo de' Medici, who took the boy under his patronage and destined him to become the translator of Plato into Latin. The lifework of Ficino was devoted to a study of Plato, Plotinus, and other Neoplatonists, and to an attempt to reconcile Platonic philosophy with Christianity. Ficino took orders at the age of forty; and four years later completed his translation of Plato's works, which were published at the expense of a patron in 1482. He also translated Plotinus, Iamblichus, and Proclus, wrote a life of Plato, and a treatise on the *Platonic Doctrine of Immortality,* a collection of the theories discussed by the Platonic Academy, established by the Medici, of which Ficino was the president.

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FICKLIN, JOSEPH (1833–1887). — Textbook author and college professor; was graduated from the Masonic College at Lexington, Mo., 1854. He was principal of the high school at Trenton, Mo. (1854–1859); instructor of mathematics in the female college at Bloomington, Ill. (1860–1864), and professor in the University of Missouri (1865–1887). Author of a half dozen mathematical textbooks.

W. S. M.

FIELD EXCURSIONS. — See Excursions, School.

FIELD LESSON. — In many of the natural sciences, laboratory experimentation and textbook instruction are supplemented by class expeditions into the country, where natural phenomena are observed in their usual setting, and specimen materials are collected. In the high school field work is given in connection with botany, zoölogy, and geology; in the elementary school with geography and nature study. The field lesson is one type of school excursion. Field lessons and school excursions are valuable and necessary, if the more or less artificial objective work of the classroom is to be properly supplemented. They afford a concrete basis for appreciating much that the school can only give through description. Their use is enlarging in the modern school. They are still largely maintained as voluntary activities outside of regular school hours, though the growing sanction for school excursions during regular class periods tends to extend to class field lessons in the natural sciences.

H. S.

See Excursions, School; Object Teaching.

FIELD OF CONSCIOUSNESS. — Certain experiments indicate that there is a limit to the number of experiences which can be included in a single act of conscious apprehension. There is a still further limitation upon the number of experiences which can be recognized with all clearness. The term "field of consciousness" has been employed to describe the total range of experiences which can be had in a single pulse of consciousness, whether these experiences are clear or vague. The field of attention, on the other hand, falls within the field of consciousness, and includes only those processes which are distinctly recognized.

C. H. J.

FIELD OF REGARD. — The totality of outer space which can be seen by the moving eye. It may be represented by a plane surface which moves with the head or the eye, and in which, for any given position, there is a fixated point, — one imaged on the fovea of the eye. It is apparent that resting objects change their positions in the field of regard when the head or eye is moved. R. P. A.

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Sanford, E. C. *Course in Experimental Psychol.,* No. 119. (Boston, 1894.)

FIELD OF VISION. — The totality of points in outer space visible to the immovable eye, sometimes used interchangeably with *field of regard,* which, however, applies properly only to the totality of points visible to the moving eye. The extent of the field of vision may be found by using a perimeter, usually a metallic arc of 90°, at the center of which the eye is placed and made to fixate (see Fixation) one end of the arc. The experimenter determines those points on the arc at which the subject just begins or ceases to see a small object moved along the arc. By rotating the perimeter so as to cover the various meridians of the eye, the entire field of vision may be plotted. R. P. A.

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Helmholtz, H. L. F. *Physiologische Optik,* 2d ed., pp. 678 ff. (Leipzig, 1896.)
Sanford, E. C. *Course in Experimental Psychol.,* No. 119. (Boston, 1894.)

FIELDEN, SARAH (1819–1910). — An Englishwoman born in Liverpool, who devoted the whole of her life to the advancement of education. Her grandfather, a Unitarian minister, founded the first undenominational elementary school in Liverpool. Mrs. Fielden showed an early interest in the social and philanthropic work in which the members of her family were engaged. On moving, after her marriage to a wealthy Lancashire manufacturer, to Todmorden, she taught in the factory schools (*q.v.*) of the district for a time, and then in an elementary school which enjoyed government aid. Later she built a model school on her estate at Centre Vale in Todmorden, where she was able to put her own ideas, based on observation of English and Continental systems, into practice, and also to train many teachers. When the school boards were established, she became a member of the Todmorden School Board from 1874 to 1889. During the early part of this period she lectured locally on *Methods of Teaching,* with practical illustrations in a class of selected pupils. In her school she introduced a system of signals to maintain discipline and order. She gave useful evidence before the Royal Commission of 1888. In 1902 she was coöpted a member of the local education committee, a high tribute to her services to education. Fruitful as her own immediate work had been, the endowments by her of a Chair of Education at the Manchester University in 1899, now filled by Prof. J. J. Findlay, and her support of the Fielden Demonstration School, which through her generosity is now located in a suitable building standing in its own grounds, are likely to lead to results of great importance and influence in English education. The university recognized her lifelong services to education by conferring on her the degree of Litt.D. in 1906.

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FIGURATE NUMBERS. — This term was applied by Nicomachus (*q.v.*) to certain numbers that represented various regular polygons. (See Polygonal Numbers.) The term is now generally applied to the numbers below the line in the following table: —

	1	1	1	1	1	
	1	2	3	4	5	....
I	1	3	6	10	15	....
II	1	4	10	20	35	....
III	1	5	15	35	70	....
IV	1	6	21	56	126	....
.	.	.	.	.	.	
.	.	.	.	.	.	
.	.	.	.	.	.	

It will be noticed that each number is the sum of the numbers in the preceding row. Thus, $56 = 35 + 15 + 5 + 1$. It will also be noticed that by drawing a diagonal from the *n*th 1 at the left to the *n*th 1 at the top, the binomial coefficients are found. (See Pascal's Triangle.) These numbers include not only the polygonal numbers (*q.v.*), as indeed all natural numbers, but many that are not polygonal. The subject played an important part in medieval education, but it has now only an historic interest. D. E. S.

FIGURES. — See Notation; Significant Figures.

FILELFO, FRANCESCO (1398–1481). — One of the most prominent among the humanists of the Italian Renaissance; born at Tolentino. After studying under Barzizza, he became professor at Padua at the age of eighteen, and in the following year was invited to Venice to teach eloquence and moral philosophy. From 1420 to 1427 he was secretary to the Venetian consul at Constantinople, where he seized the opportunity to learn Greek from John Chrysoloras, a nephew of Manuel, whose daughter he married. On his return to Italy he held appointments as professor of eloquence at Venice, Bologna, and Florence. His reputation as a scholar was very high; his knowledge of Greek, and the possession of valuable works, which he had brought back from the East, gave him a position of eminence. But he lacked critical judgment, taste, and creative ability, and his personal character was of the worst. At Florence he gave four lectures a day, to audiences consisting of the noblest citizens, on Greek and Latin authors ; he also delivered public lectures on Dante. When he quarreled with the Medici, he left Florence, and after a short interval found a welcome in Milan, where he was received by the Duke as a noble. At Milan, with short interruptions, during which he held an appointment at Rome and again at Florence, he remained till shortly before his death.

Filelfo was very productive as a writer; he translated many Greek works into Latin, including selections from Xenophon, Lysias, Aristotle, and Plutarch ; his original works were labored and stilted satires and odes, orations and begging letters addressed to men of eminence whenever, through his own extravagance, he considered that his high position as the first scholar of his day was not sufficiently rewarded. Although his influence for the progress of scholarship was considerable, Filelfo presents a character that is the least pleasing among Italian humanists.

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FINANCE, SCHOOL.— See BUDGET, SCHOOL; COST OF EDUCATION ; REPORTS AND RECORDS.

FINANCIAL REPORTS. — See BUDGET, SCHOOL ; REPORTS AND RECORDS.

FINDLAY COLLEGE, FINDLAY, OHIO. — A coeducational institution founded on the proposal of the General Eldership of the Church of God in 1881, the citizens of Findlay contributing ten acres and $20,000. The college was incorporated in 1882. Preparatory, collegiate, normal, theological, music, fine arts, and expression departments are maintained. The admission requirements are equivalent to about fourteen units of high school work. Degrees are given in the various collegiate departments.

FINE ARTS. — See ART IN EDUCATION ; ART IN THE SCHOOLS; ART SCHOOLS; DESIGN.

FINES. — See REWARDS AND PUNISHMENTS.

FINGER RECKONING. — Chiefly owing to the difficulty of obtaining inexpensive material for writing, there arose in ancient times a digital system of representing numbers and computing. It may be compared as to general appearance with the digital language of the deaf and dumb as used at present. Very likely it was a development of the primitive system of counting on the fingers, which gave rise to our decimal system. (See NOTATION.) At any rate, we have evidence that the ancients used it for the purpose of remembering the numbers in a computation, as on the abacus (*q.v.*), and for the computation itself, and also for the purpose of bargaining. Even as late as the sixteenth century, it was used in Europe for all three of these purposes. It is probable that Solomon refers to it when he says that " length of days is in her right hand," the right hand being used in all such systems to represent hundreds. Possibly Aristophanes (*q.v.*) refers to it in the *Wasps*, when Bdelycleon tells his father to do an easy problem by the help of his fingers. The semi-mythical Numa Pompilius is said by Pliny and Macrobius to have erected a statue of Janus, the fingers of which indicated the number of days of the year. There are several well-defined references to the system in the works of classical writers. Thus Plautus says: —

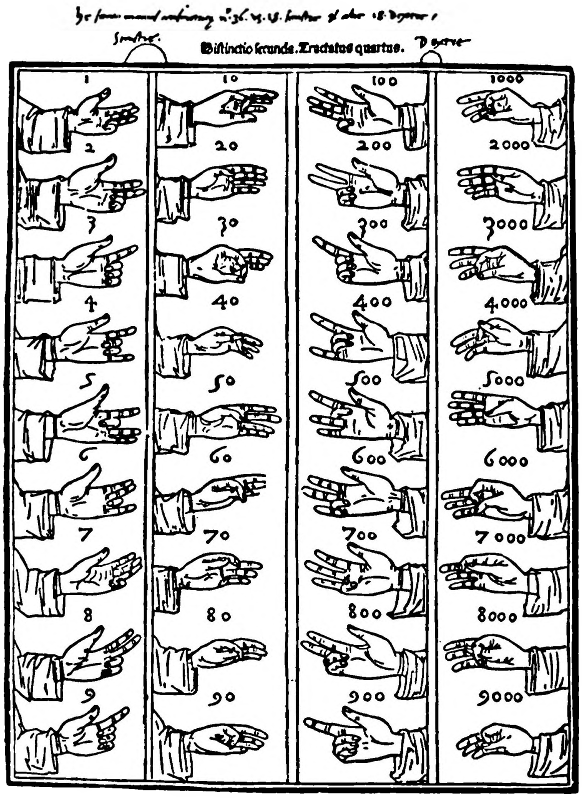
> . . . lævo in femore habet lævam,
> Dextera digitis rationem computat, feriens femur
> Dexterum.

Seneca also speaks of it in these words: *Numerare docet me arithmetica et avaritiae commodare digitos*, and Pliny uses the expression *Agitas digitos, computas nihil.* The best classical reference is in Quintilian (I, 10, 35), and the first instance of an actual problem is in the *Apologia* of Apuleius. Augustine frequently refers to it in his efforts to inject a Pythagorean mysticism of numbers into his theology. In one of his sermons, in speaking of the " ninety and nine," he says: *Quid est, ad nonaginta novem pertinent? In sinistra sunt, non in dextera . . . unum adde, ad dexteram transitur.* This shows that the people to whom he was speaking must have been familiar with the fact that 99 was represented on the left hand, and 100 on the right.

It is to Bede (*c.* 725) that we are indebted for such detailed knowledge as we have of the medieval system. (*De loquela per gestum digitorum*, in his *Opera omnia*, tomus I, p. 689. Paris, 1862.) After his time numerous writers are found who give descriptions of the process, particularly in regard to computations for Easter. (See COMPUTUS.) The first good description in print is that of Paciuolo (*q.v.*), whose *Summa* (*Sūma*) appeared in 1494. The system as given by him can be somewhat understood from the following illustration from his work.

Similar illustrations are given in works by Tagliente, Apianus, and Robert Recorde. (For the illustrations see Smith, D. E., *Rara Arithmetica.* Boston, 1907.)

The system continued in use until about 1600, when it died out as a school study, although it has remained to the present time as a tradition among the people. It is not uncommon to find people to-day, particularly in rural communities and in some remote places in Europe, who multiply on the fingers exactly as the ancients did. Thus to multiply 7 by 8, raise 2 fingers on one hand and 3 on the other (since 5 + 2 = 7, and 5 + 3 = 8). Then add the raised fingers (2 + 3 = 5) and multiply the others (2 × 3 = 6), and the result is 5 tens + 6, or 56. Similarly, 8 × 9 is (3 + 4) tens and 2 × 1 units.



In practical education at the present time many teachers fear the effect of letting children count on their fingers. It is, however, a race habit, and the danger is easily overcome by continued rapid oral work throughout the early years of arithmetic. D. E. S.

FINLAND, EDUCATION IN. — The Grand duchy of Finland covers an area of 144,225 square miles in the northwestern part of Russia, bordering on Sweden and the Gulf of Bothnia. Its population is remarkably homogeneous, Finns forming about 86.7 per cent and Swedes 12.7 per cent of the nearly 3,000,000 inhabitants. The capital is Helsingfors, having a population of 130,844. Abo, the next city in size, has 46,637, and there are six remaining cities with populations of fifteen thousand and upwards. The rural population comprises 86 per cent of the total; and consequently provision for primary education outside of the towns is a matter of supreme concern to the State.

Three influences have determined the course of public instruction in Finland, its relation to Sweden, with which it was united from the fourteenth to the nineteenth century; the reformed religion; and the diffused sense of national solidarity. Fully 90 per cent of the people are adherents of the Lutheran Church, and five centuries of unswerving devotion to its doctrines and discipline have developed among them a deep sense of moral responsibility, while the exercise of the franchise, which, beginning in the seventeenth century with well-defined class distinctions, was recently placed on a popular basis, has developed equally the patriotic spirit.

Primary Education. — There are practically two systems of education in Finland, one clerical, the other national. The former arose from the church requirement that the clergy should examine all children of their respective parishes at least once a year in reading and the Catechism. By the ecclesiastical code of 1686 this elementary knowledge was made a prerequisite to communion, and later codes, in particular that of 1869, have made it obligatory upon the communes to provide such elementary instruction for children whose parents are unable to do so. The annual examination by the parish pastor is a regular fête day for children and adults, and its importance is increased by the fact that every five years reports of the examinations are forwarded to the central Board of Education. The ambulatory schools grew out of this obligatory clerical instruction. In accordance with the ecclesiastical code, every parish is divided into school circles, or districts, varying in number, and a teacher is appointed for each circle. The teacher makes the tour of the circle in a scholastic year, remaining in each of the assigned villages from four to eight weeks, teaching the children of the neighboring hamlets, and then passing on to the next village.

Early in the nineteenth century a movement for national education was started by leading men in the province, and gained the support of the Emperor Alexander III. The chief promoter of the movement was Uno Cygnæus, who was an ardent advocate of the democratic ideas then rife in Europe. Having been appointed inspector of elementary schools, Cygnæus made an extended tour for the purpose of studying the systems and principles of popular education in Germany, France, and Switzerland. His practical work in his own country began with the establishment of a normal school at Jyväskylä in 1863, on the model of those in Switzerland. It was a residential school conducted on Pestalozzian principles, the time of the students being divided between studies, domestic industries, and work in the garden and field. The school departed from the Swiss models by the admission of both sexes, although they were instructed in separate sections.

The foundation of the primary school system was laid by the ordinance of 1866, which required every urban commune to establish a sufficient number of primary schools for the accommodation of all children between eight and fourteen years of age, and to offer a prescribed program of studies. These schools were to be supported by the communes with aid from the state treasury and to be under public inspection. As regards rural districts, the ordinance of 1866 simply provided that the ambulatory schools should be recognized so far as they were preparatory to the primary schools proper. For this purpose it was required that, in addition to reading and religious instruction, the pupils should be taught the elements of writing, arithmetic, and singing. By an ordinance of Nov. 24, 1869, the general administration of the national system of primary education, as well as that of the secondary schools which heretofore had been under ecclesiastical direction, was vested in a central board or council of education, *Ofverstyrelsen för Skolväsendet.* The members of this council are appointed by the Senate (constituted by imperial appointment), upon the nomination of the Diet (legislative assembly). The executive chief of the system, the Director-General, is also appointed by the Senate. An assistant director has charge of primary education, and there are government inspectors for both secondary and primary schools.

The establishment and direct control of primary schools rest with local boards or committees; on which the clergy are always represented; the organization and programs of the schools are determined by regulations emanating from the central board. The urban schools are: (1) elementary primary schools for children seven to nine years of age; (2) ordinary primary schools for children nine to thirteen; (3) complementary or continuation schools with a one-year course. There are also preparatory schools with a course of two years for children who have reached the age of ten years and have not learned to read; auxiliary schools for feeble-minded children; and evening schools for pupils above twelve years of age who are unable to attend day schools.

The elementary primary schools are mixed as regards sex; when the higher primaries are reached, boys and girls attend separate schools. The course of study for the elementary schools includes religion (supervised by the clergy), reading, writing, the mother tongue, arithmetic, geometric figures, drawing, singing, and gymnastics; to these branches are added, in the upper section, history, geography, the measurement of surfaces and volumes, the natural sciences, and manual training.

It was not until 1898 that the rural communes were required by law (May 24) to establish public primary schools. The rural school districts must be so arranged that a school may be placed within five kilometers of every family. Even before the passage of this law, nearly every rural district had established at least one primary school. The rural primary schools correspond in a sense to the upper section of the city schools. They are termed *högre folkskoler*, as children enter them at nine years of age after completing the elementary stage, by means either of the ambulatory school or an infant school. Boys and girls are instructed together in the rural primaries. The program is modeled, so far as possible, upon that for the urban schools. The primary schools are not free, but the fees are small, and may be, and often are, remitted. After the elementary stage is passed, school attendance is not compulsory. Evening schools are maintained for both boys and girls above twelve years of age, who are unable to continue attendance upon day schools. Classes for adults are maintained both in cities and in rural districts, and, if they follow the official course, they receive a subvention from the State.

The Teachers. — The law requires that all teachers of primary schools shall be trained, and the first normal school established by Uno Cygnæus has been followed by others, situated at convenient centers. But as primary schools multiply in the rural districts it is not always possible to secure trained teachers for them. Teachers' conferences are conducted by the district inspectors, at which principles and methods of primary education are expounded and the professional spirit is stimulated among the teachers by their participation in the general meeting called by the central director, every three years, for the discussion of programs and methods.

Teachers' salaries vary greatly. The maximum is reached in Helsingfors, where the director, or master, of a school receives 3900 marks a year ($750) and a directress 3300 marks ($637). In the smaller cities the annual salary does not exceed that paid in rural schools. The State guarantees a minimum salary with increments of one tenth at stated intervals. After thirty years' service, a teacher is entitled to a pension, amounting to 1000 marks a year for a man and to 750 marks for a woman.

Statistics. — The distribution of pupils and teachers among the various classes of primary schools in 1909 was as follows: —

CLASSES	NUMBER	TEACHERS			ENROLLMENT		
		Men	Women	Total	Boys	Girls	Total
Rural schools:							
Infant .	1583						38,479
Higher primary	2663	1681	1516	3197	58,989	53,373	112,362
Urban primary schools .		311	851	1162	16,770	16,836	33,606
Evening schools .					361	371	732
Other primary					249	654	903
Total					76,369	71,234	186,082

If to the total number of pupils given above, namely, 186,082, is added the number of children taught in ambulatory schools, at present estimated at 150,000 (the official report of 1906 gave the number as 183,000) the resulting total, 336,082, is equivalent to 11 per cent of the population.

NORMAL SCHOOLS, 1908

Location and Language of Instruction	Teachers			Students		
	Men	Women	Total	Men	Women	Total
A. Finnish						
Jväskylä	10	5	15	121	126	247
Soidavala	12	4	16	126	125	251
Raumo	7	—	7	118	—	118
Brahestad	4	4	8	—	119	119
Heinola	4	4	8	—	126	126
Kajana	7	—	7	115	—	115
Total	44	17	61	480	496	976
B. Swedish						
Ekenas	4	4	8	—	90	90
Nykarleby	7	—	7	66	—	66
Total	11	4	15	66	90	156
Grand total	55	21	76	546	586	1132

The number of graduates from the normal schools in 1908 was 297, which indicates an unusually large attendance in the fourth or upper class.

The expenses of the national system are borne by local resources, of which tuition fees form a small part, and by state appropriations; the latter meet the larger part of the cost of maintenance for rural schools, and about 25 per cent of that for city schools. The total expenditure by the State for primary education amounted in 1908 to 6,761,816 marks ($1,305,030); the cities contributed also about 4,000,000 marks ($772,000).

Ample provision for the education of the defective classes is also made in State or State-aided institutions, for which about 690,000 marks ($133,170) are annually appropriated.

Finland owes to its relation with Sweden two forms of training which have exercised a great influence upon the character and habits of the people, namely manual training or slöjd, and gymnastics, based upon the Ling system. Popular education is continued after the brief period of school life by the efforts of associations which maintain peoples' high schools after the model of those of Denmark. In 1908 these schools numbered thirty-eight, with 227 teachers and 1671 students. The State appropriated 266,750 marks toward their maintenance. The associations also foster the national spirit by festivals of music and song, which are held in different parts of the country, and in which trained choirs numbering hundreds of people participate.

Technical Instruction. — Special schools of slöjd for men and for women are organized throughout the grand duchy, and not only maintain the manual skill for which the people are noted, but supply the simple implements required for domestic use. The abundance of timber naturally directed the earlier technical training toward wood-work. Gradually the scope of the training has been extended, and there are at present seven well-equipped state technical schools, above 450 schools of arts and trades, and numerous schools of weaving and domestic arts for women, maintained by the communes with aid from the State. The central school of industrial arts at Helsingfors was established in 1875 by the efforts of a private citizen, Mr. Estlander, and placed under the administration of the Finnish Society of Industrial Arts.

Finland has also made comparatively large provision for the training of agriculturists by means of dairy schools, schools of horticulture, schools of agriculture, etc. The crown of the system is the Agricultural Institute at Mustiala, founded in 1840. It comprises at present a section of agriculture with accommodations for forty-two students, and a higher course in dairy work for ten students; to the latter women are admitted. There is also a higher school of forestry at Evois, with accommodations for thirty-five students. According to the latest official report, the number of students preparing in these various classes of schools for industrial careers was as follows: —

Schools	Students
Schools of slöjd	2300
Industrial schools	1060
Schools of arts and trades	1477
Schools of agriculture, horticulture, forestry, etc.	1340

For the above schools the State appropriates annually about one and a quarter million marks ($241,250). There are also seven schools of navigation, with 175 students, and fifteen schools of commerce, with 1270 students, which receive an annual subvention from the State.

Secondary and Higher Education. — The first secondary school (gymnasium) in Finland was founded in 1630 at Abo, and placed under the ecclesiastical authorities. Ten years after a university was established at the same place, to which the gymnasium served as a preparatory school. The course of instruction, which included the studies of the *trivium* and *quadrivium*, was intended to prepare young men for the service of the Church and the State.

The influence of Comenius, who was called to Sweden in 1649 to assist in the reform of the school code, extended to the Finnish province, and as the number of secondary schools increased, there was a noticeable tendency toward freedom and flexibility in their curriculum. An act of 1872 removed secondary schools from ecclesiastic control and placed them under the civil authorities. At that time three classes of secondary schools were recognized, namely, *lyceer* (lyceums), *realskoler*, and the higher schools for girls; these were classified together as *elementarlaroverken*, implying the stage preliminary to university studies. The lyceums are divided into the inferior, which have a four years' course, and the higher, an eight years' course; the latter, or full-course lyceum, prepares students for admission to the university; and in like manner the courses of the realskoler lead to the technical high school.

According to the latest official statistics (1908), the twenty-six state lyceums for boys had 427 professors and 6426 students, and the seven state *realskoler* for boys 103 professors and 621 students. There were also sixteen state secondary schools for girls, with a force of 244 teachers and 3419 students. This public provision was supplemented by private secondary schools of various types, with an enrollment of 11,722 pupils (4220 boys, 7502 girls). For the current expenditure of secondary schools, the state appropriation in 1908 amounted in round numbers to 5,000,000 marks ($965,000). Of this amount 53 per cent went to public secondary schools for boys; 16 per cent to the corresponding schools for girls; the remaining 31 per cent was distributed among the private secondary schools.

The Alexander University was removed from Abo to Helsingfors in 1827, the original buildings having been destroyed by fire. The present constitution was adopted in 1852; but the university has had marked increase in scope and resources since that date. A unique feature of the internal life of the institution is the organization in six "nations," based upon the subdivisions of the grand duchy. Every student must enroll himself in one of these "nations," each of which has a constitution and disciplinary powers of its own after the manner of the "nations" in the older universities. The following table shows the distribution of professors and students by faculties in 1909: —

Faculties	Number of Professors	Number of Students
Theology	8	96
Law	10	415
Medicine	38	185
Philosophy		
History and Philology	63	635
Physics and Mathematics	27	550
Agricultural Economy	11	145
Laboratory	7	
Total	164	2026[1]

The income of the university in 1908 amounted to 2,500,000 marks ($482,500), of which 1,730,000 marks, or 69 per cent, was the state appropriation.

The technical high school is the former Polytechnic Institute reorganized in accordance with a law of Apr. 2, 1908. It comprises five sections, as follows: architecture; engineering; mechanical engineering; chemistry; carpentry. The course of study is four years in the first four sections; three years in the last. The total number of students in 1909 was 349. Students who complete either course and pass the final examination receive the diploma of the school, inscribed with the name of the respective section. Candidates for the doctor's degree must have the diploma of the school, must present a thesis embodying the results of original investigation, and pass a special examination. Like the university, this institution is marked by scholastic breadth and freedom. The prosperity and national character of the Finnish system of education are threatened by the recent dissolution of the Diet and the transfer of its prerogatives to the Russian government. A. T. S.

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FINLEY, SAMUEL (1715–1766). — College president; educated in private schools in Ireland and Philadelphia; he was for many years principal of an academy in Maryland, and was president of Princeton College from 1761 to 1766. W. S. M.

FIRE PROTECTION. — For School Buildings. — The problem of fire protection is one of great importance in the building of schools. No attempt is made here to deal with the purely technical side of the question, but for the general reader the following points include the essentials of fire protection: —

1. Wherever possible, all school buildings, especially in cities, should be of fireproof construction. They are not only safer, but are more economical in the long run. It is perfectly possible at this time to build schoolhouses, as well as other buildings, thoroughly proof against fire from within, without entailing a wasteful expenditure of money; but it is much more difficult, and perhaps impossible, to construct a building that will withstand a conflagration. In general, however, there should be no need of building schoolhouses in locations which will demand protection from the danger of fire from without, for they ought to be so far removed

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[1] Includes 440 women.

from neighboring structures that they would be safe from such contingencies. In cities where it seems to be impracticable to isolate school buildings sufficiently from other inflammable structures, so as to protect them from danger, it is nevertheless true that thorough protection from within practically eliminates the danger to the lives of the children in all day schools. When school buildings are endangered from fire in neighboring structures, it would rarely, if ever, happen that sufficient time and warning could not be given to the children to escape in safe and orderly fashion. The best advice, then, that can possibly be given to those whose duty it is to plan and construct our public school buildings is to make them thoroughly fireproof from within, and if possible locate them where they will not be endangered from without. Boarding schools and dormitories demand still greater care in this direction, for here the pupils are more seriously exposed day and night.

Theoretically there should no longer be any need to try to impress upon boards of education the wastefulness of time and the insanitary results of locating a school building on a small lot near other buildings or near dusty streets. It has been demonstrated again and again that, if our children are expected to do their work with the least waste of time and nervous energy, they must be furnished a quiet place in which to do their work. Likewise, investigations have shown that school buildings must be removed a safe distance from other buildings in order to get light in sufficient amount and of the proper quality to save the eyes of the children from unnecessary strain due to lack of light and glaring reflections. Adjacent roadways or streets, in addition to the noise of vehicles, make it almost impossible to keep the air in schoolrooms from filling with dust and dirt of a dangerous character. It is plain, then, that not only for the sake of protection from fires originating outside, but for many other reasons, it is a matter of vital moment that school buildings should be constructed on a large lot in a safe location.

2. All schoolhouses of two or more rooms should be heated by some sort of central heating system. When this is placed in a basement in buildings of wooden construction, the floor joists above the furnace or boilers should be adequately protected by asbestos boards and galvanized iron, or some equally effective protection. The basement floors and walls should be of cement. In those parts of our country where steam or hot water systems are to be preferred to the hot air furnace, and where adequate space is at hand, the boiler rooms may be outside the main structure and the heating medium introduced into the building through pipes from the boilers. Such a plan is safer than the one where the boilers are placed in basements, and also make it possible to get rid of heavy chimneys in the main buildings, for such chimneys are dangerous in times of earthquakes or storms. But with due care in management, and with fireproof construction, it is not a serious menace to house the heating appliances in the basement. When two or more buildings are sufficiently near together to get their heat supply economically from one source, it is generally better, if space can be spared, and if steam or hot water is used as the medium, to locate the boilers in a detached building.

3. The coal bins, or rooms for other fuel, must be at a safe distance from the fire, and yet not so far removed as to be inconvenient. It is generally convenient to build coal bins underground outside of the buildings, with shutes opening at the surface of the ground into which fuel can be dumped easily. There should also be ashpits, carefully built, into which the cinders and ashes could be dumped without in any way endangering the building. Local conditions will always determine the position of these and their mode of construction. For example, when the basement floor is at or near the surface of the ground, other methods than those suggested must be devised. It is always possible, and in fact altogether necessary where oil is used for fuel, to construct a cistern outside of the building and force the oil into the furnace by an electric or steam-driven pump. On the whole, where oil is properly cared for, it seems to introduce fewer dangers as a fuel than coal or wood.

4. In the country, where stoves must be used in the schoolrooms, the floor about the stove should be protected with tiles or glazed bricks. These, with a little planning, and with but little added expense, can be set flush with the floor, and will neither disturb the general appearance of the room nor be in the way. A jacketed stove (see HEATING OF SCHOOLROOMS) can be made far safer than the ordinary box stove, because the former does not get so hot. The cold air rushing in from without keeps it comparatively cool. The chief danger from fires in those buildings where stoves are used arises from poorly constructed flues, or defective pipes. A jacketed stove, set as just described, can be used with comparative safety, provided the inlet for fresh air is carefully protected against fire.

5. All chimneys or flues should be made of selected bricks, set with the best grade of cement mortar, and have within each a complete stem of well-burnt flue tiling, carefully set and jointed. It is very poor economy to neglect such precautions, for, as noted above, most fires originating in buildings where stoves are used arise as the result of defective flues. It is not infrequent to find in the country a flue constructed of one layer of ordinary soft brick, put together with mortar made of a little lime and much sand. It is only a matter of time until cracks open between the bricks, and then such flues become a constant menace. Another danger comes from improper arrangement of the pipe. In the beginning the joints may fit well; but after heating and cooling many times the upper joints slip lower and lower until

danger is imminent. It is essential, therefore, to so construct flues and so carefully set the pipe that all such dangers may be avoided. It is a singularly strange thing how careless the average American builder is in matters pertaining to fire protection.

6. All electric wiring should be done with thoroughly insulated wire encased in safe conduits, and protected with ample fuse connections. This is a necessary and important precaution, especially in wooden buildings, or those not thoroughly fireproof. The advent of electric lighting has brought much relief, but likewise danger; for hidden wires poorly insulated constitute an ever present menace. Most states have laws relating to electric wiring of public buildings, and insurance companies take especial precautions in this regard.

7. Gas pipes for laboratory, heating, cooking, or lighting purposes should be thoroughly tested, and, wherever possible without obtrusion, left free, for inspection and repairs. Explosions and fires are not infrequent consequences of badly placed and imperfect gas pipes.

8. All laboratories, cooking rooms, and forge rooms should have fireproof floors, and as far as possible fireproof walls and ceilings. It is far safer and generally more economical for forge rooms to be placed in separate buildings.

9. School buildings should not be more than two stories high, at least for the primary grades. Three stories are allowable for high school grades where ample stairway facilities are afforded. With such a limit school authorities in cities will find fault; but when buildings exceed these heights, they are endangering the children accordingly. Buildings safely removed from other structures and of thorough fireproof construction may be higher as far as the danger of fire is concerned; but on the basis of other considerations ought to be discouraged. The danger of a stampede is greatly increased in those school buildings more than two stories high. Elevators are generally useless in time of fire, and often positively dangerous.

10. All buildings used for school purposes, and especially if they are constructed of inflammable materials, should be protected by a water supply under sufficient pressure and with hose attachments properly located and always ready to check or put out fires during school hours. This is possible now, even where no public water system exists, for by the use of the pressure tank system elsewhere described (see SANITARY WATER SUPPLY FOR SCHOOLS) water can be kept under pressure and ready at all times.

11. Fire extinguishers should be at hand wherever there is any likelihood of danger, and all teachers, as well as the janitor, should be drilled in their use. Fire extinguishers are valuable only in the early stages of a fire, and must be used quickly and intelligently if any satisfactory results are expected.

Protection of School Children from Fires. — 1. All exit doors should swing outward. Even those leading from the classrooms into the halls are safer when so hung, if the halls are wide. Otherwise it is better for these to swing in. The outside doors should all be furnished with an emergency fire lock, so that, while they are securely fastened from without, they can never be so fastened from within that the smallest pupil cannot open them by a light pressure. Such locks are now on the market, and should be used on all larger or medium-sized school buildings.

2. All stairways should be of fireproof construction, especially in wooden buildings. They should be wide, of easy tread, with wide landings and solidly built banisters. The number of stairways should amply meet the demands of all the children gathered at any one time on the second floor. The landings should be in width twice the length of the stair tread.

3. Assembly rooms should be built on the first floor, for it is impossible to institute fire drills for those who do not regularly attend school, and no one can handle an undrilled crowd in an emergency. If built on a higher level than the first floor, the number of exits will be materially limited, and the necessary stairways will multiply the danger many-fold.

4. Hallways should be wide, well-lighted, with no projections, lockers, or hat pegs to interfere with rapid moving toward the exits. These are important considerations from many points of view as well as from that of fire protection.

5. Fire drills should be instituted in all school buildings where a common exit hall is used by two or more rooms. The larger the building and the greater the number of children accommodated, the more imperative the need of fire drills. No specific rules can be given to guide in such drills, for these must be ordered and practiced to suit local conditions; but a few general suggestions may prove beneficial. (*a*) All books and wraps must be neglected. If one child should attempt to gather up books or wraps, others would do the same thing, endangering all. (*b*) Each child must know precisely where be belongs in line, and must be drilled to keep this place at all hazards. Crippled children ought to be especially looked after. One or two cripples may disarrange the entire line. (*c*) It is best to march in time, and some musical instrument will help, not only by its assurance, but by distracting thought from danger and also by regulating the rate of the marching lines. A drum is good for such occasions. (*d*) All pupils delegated as helpers must be trained to do their work carefully and quickly. (*e*) The lines ought not to crowd the stairways or halls, and naturally no pupil must have a stopping place from the time he starts until he makes his exit safe from danger. (*f*) The primary grades should leave first, to be marched a good distance from the building before stopping. To this end, and for other reasons, the primary grades should always occupy rooms on the first floor.

6. Fire escapes in school buildings are only for exceptional cases. The ordinary iron stairs or ladders on the outside of the building are of questionable use. They cannot be used safely by small children, and are likely to cause confusion and panic where their use is attempted. The tubular toboggan escape is much better, especially if easy of access from the upper halls is assured. But if due care is taken in the location and construction of school buildings, and watchfulness on the part of principal and janitor is persistently maintained, the use of the stairs and fire drills will avoid all dangers from fires, save in the event of possible explosions. A thousand children can be drilled so as to make their exit from a well-planned two-story schoolhouse in a minute.

In addition to careful fireproof construction of the building as a whole, it is sane and sensible advice to urge those who build schoolhouses to protect the children by wide halls, wide fireproof stairways, roomy landings, and the isolation of all school buildings from any inflammable neighboring structures. F. B. D.

See ARCHITECTURE, SCHOOL.

FIRMIN, THOMAS (1632–1697). — A London philanthropist who spent the greater part of his wealth, amassed as a silk mercer, in experiments for the purpose of improving the condition of operatives in factories. In one of these he employed at one time as many as seventeen hundred hands. He was interested in the industrial training of children found in the streets. At his own expense he had printed large editions of a *Scripture Catechism*, for learning which prizes were awarded. He was a member of the Trust, to which his friend, Thomas Gouge (*q.v.*), also belonged, for distributing Bibles and establishing schools in Wales. He was elected a governor of Christ's Hospital, a charitable educational foundation, in 1673, and took a deep personal interest in the welfare of the pupils. He was also a member of the Society for the Reformation of Manners, established in 1691.

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FIRST AID TO THE INJURED. — See INJURED, FIRST AID TO.

FIRST SCHOOL YEAR. — The term is usually applied to the first year of work in the elementary school, which is generally begun at about the age of six years. The term thus leaves out of account any previous years of training in the kindergarten. It is conventionally used to describe the first year of formal education commonly given to children in all American communities. Not infrequently the first-year class at school is termed the *receiving* class or grade.

A quarter of a century ago the work of the first year was mainly given over to instruction in the beginnings of reading, arithmetic, spelling, and penmanship. Three conspicuous changes are apparent in present first-year instruction. These differentiate it sharply from the older practice. (1) The beginning of certain of these subjects is postponed. Penmanship and spelling may be delayed from three to six months, and systematic instruction in arithmetic may not be commenced for six months, a year, or even two years. (2) The teaching of children to read therefore holds the central place in the systematic instruction. Whatever other subjects may be taught, and in whatever manner reading itself may be mastered in connection with history and nature stories, plays, and games, manual training, and similar activities, it is the main object of the first year to advance the child's ability to read so that he may gain new experiences through linguistic presentation. (3) The first year of instruction has ceased to deal exclusively with the mere forms and tools of education, and even the mastery of such conventional facts as the forms of words and the arithmetical combinations is based upon many concrete and interesting experiences intrinsically valuable to the children. Contact with real things of every sort, from the gifts and materials of the kindergarten to the living objects of nature study, is guaranteed as never before. The children are much more active in their ways of learning. A more or less passive memorization has given way to an active absorption. Children learn through manual training, through an active and responsible control of window and school gardens (*q.v.*), through playing, singing, dancing, and dramatization. The subjects read are more closely adapted to the child's vital interests. Dull, formal sentences in the reading book have given way to content that expresses situations appealing to children. Objective, active, and interesting methods of teaching thus characterize the first year of school life more completely than any later year of instruction. H. S.

See READING, TEACHING BEGINNERS.

FIRST-YEAR READING. — See FIRST SCHOOL YEAR; READING, TEACHING BEGINNERS.

FISHER, WILLIAM WARE (1814–1874). — Sixth president of Hamilton College, graduated at Yale College in 1835, and at the Union Theological Seminary four years later. He was president of Union College from 1858 to 1866. W. S. M.

FISK UNIVERSITY, NASHVILLE, TENN. — A coeducational institution for colored people, founded in 1865 under the auspices of the American Missionary Association and the Western Freedman's Aid Commission of Cincinnati. The university was incorporated in 1867. Each boarder is required to give a period a day to some form of labor as directed. A grammar school and preparatory college, normal, teachers' training, music, and theological departments are maintained. Candidates for admission to the college must meet requirements equivalent to fourteen units. The requirements for the normal department are grammar school subjects. There is a teaching staff of thirty-seven members.

FISK, WILBUR (1792–1839). — First president of Wesleyan University; graduated at Brown University in 1815. He was family tutor for some years in Maryland; principal of Wilbraham (Mass.) Academy from 1825 to 1830; and president of Wesleyan University from 1830 to 1839. He was active in a movement for the introduction of temperance instruction into the schools. Author of *Science of Education* (1832). W. S. M.

Reference: —

PRENTICE, G. *Wilbur Fisk.* (Boston, 1890.)

FISKE, JOHN (1842–1901). — An American author, philosopher, and historian; born at Hartford, Conn., Mar. 30, 1842. He graduated from Harvard College in 1863; in 1869 he was appointed lecturer on philosophy at Harvard, and later became assistant librarian, which position he held until 1879. His earliest recognition came to him as a writer and lecturer on evolutionary philosophy. *The Outlines of Cosmic Philosophy* (1874) is his most extensive and systematic contribution in this field. His evolutionary interpretation of religious problems is best expressed in his *Destiny of Man* (1884), *Idea of God* (1885), *Through Nature to God* (1889), and *Life Everlasting* (1901). The energies of the later part of his life were given to the study of history. A forceful lecturer and a brilliant writer, he did as much to popularize history in this later period as he had done to clarify evolutionary philosophy earlier. Among his more important historical works are the *Discovery of America; The Beginnings of New England; Civil Government in the United States; The American Revolution; Old Virginia and her Neighbors;* and *The Dutch and Quaker Colonies in America.* Two of his essays are of particular interest to educators, because of the fundamental importance to educational theory of Mr. Fiske's presentation of "The doctrine of the meaning of infancy." The first of these, *The Meaning of Infancy*, is a brief and simplified restatement of the theories of man's origin and destiny, first suggested in his lectures at Harvard University in 1871, and later expanded in Part Two of the *Outlines of Cosmic Philosophy.* The second of these, *The Part Played by Infancy in the Evolution of Man*, was first presented as an address before the Aldine Club, New York, May 13, 1895. Taken together, these two presentations of the significance of human infancy constitute our most detailed and valuable elucidation of the doctrine. H. S.

See INFANCY.

FITCH, EBENEZER (1756–1833). — First president of Williams College; graduated at Yale College in the class of 1777. He taught school several years in New Jersey; was tutor at Yale College; and in 1790 took charge of the Williamstown Academy, which three years later was incorporated into Williams College. He was president of the new institution until 1815. Author of a *Latin Grammar* (1814). W. S. M.

FITCH, SIR JOSHUA GIRLING (1824–1903). — Teacher and educational reformer. Born of Essex parents in Southwark, London, where he began active life as an assistant teacher at the Borough Road School (*q.v.*), which was associated with the name of Joseph Lancaster, one of whose pupils, J. T. Crossley, was at that time its headmaster. After serving as headmaster of a school in Kingsland, and taking his degree at the University of London, Fitch was appointed, in 1852, tutor at the Borough Road Training College of the British and Foreign School Society (*q.v.*), and, in 1856, principal of the institution, an office which he held for seven years. As a teacher, he showed brilliant gifts, — sympathy with his pupils, skill in the presentment of facts and ideas, grace, clearness, and aptness of expression, a keen and sustained interest in a wide range of studies, and a deep sense of the social importance and dignity of the teacher's calling. Fitch's work at Borough Road College was highly valued by Matthew Arnold (*q.v.*), who described with praise his methods of teaching in his report on the college for 1858; and drew the attention of Lord Granville to his merits, with the result that in 1863 Fitch was appointed Inspector of Schools under the Education Department, a position which he held with great distinction and usefulness, through a period of rapid educational development, till 1894. He was knighted in 1896. During his official career he served as assistant commissioner to the Schools Inquiry Commission, 1864–1867; as special commissioner in 1869 to report on the condition of elementary education in Birmingham and Leeds (a prelude to the Elementary Education Bill, 1870); and as assistant commissioner under the Endowed Schools Act, 1870–1877 (*q.v.*). He also prepared an official report on American education in 1888, and on the working of the Free School system in America, France, and Belgium in 1891. He was thus qualified by an almost unique experience to advise the Education Department and the public as to the means of securing closer coördination between elementary and secondary education in England.

Conservative by instinct, he had realized the necessity for public supervision of educational endowments, for the extension of educational opportunities to girls and women, for university reform, and for the establishment of University Colleges in the great centers of population. Moderate opinion in England learned to trust him as a cautious and experienced guide. By his writings, official inquiries, and personal influence he smoothed the way for the acceptance of official action and increased public control in secondary and higher education. In the movement for the improvement of girls' schools he took a leading part. By his lectures on the science, art, and history of education in 1877 and (at Cambridge) in 1881, he greatly furthered the scientific study of the art of teaching, not only in training colleges, but among the men and women teachers in secondary schools. He held strongly that religious education should be kept as an integral part of the school training of every child. While he appreciated the services of the good denominational schools, and approved their continuance as part of the national system of elementary education, he based his main hopes for the future of religious instruction in public day schools upon the united Christian teaching given, without denominational bias, in the Board (now Council) Schools, under the Cowper-Temple clause (*q.v.*).

Fitch's interest in the study of American education was always strong, and his admiration of American educational effort profound. He contributed in 1902 to the Board of Education *Special Reports on Educational Subjects*, Vol. 10, Part I, an introductory essay upon "The Study of American Education; its Interest and Importance to English Readers."

Urbane, discreet, and persevering, Fitch was a tactful intermediary between the Education Department and the public, and greatly helped in bridging the gulf between elementary and secondary education in England. His diligence in public duty, combined with suave fluency of thought and style, enabled him to render, during a time of rapid growth in governmental influence in English education, a service far greater than that accomplished by many men of greater ability, profounder learning, and deeper insight into the trend of English thought and affairs. He was fortunate in his friends and in his freedom from self-consciousness and introspection. His highest gifts were those of a teacher. He was assiduous in self-improvement, punctual in business, lucid in exposition, dignified in bearing, genial in personal intercourse, and singularly fresh in his varied interests and sympathies to the end of his life. No writings record so accurately as his the normal judgment of cultivated educational reformers in England during the years 1865–1895.

M. E. S.

See ENGLAND, EDUCATION IN.

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FIVE FORMAL STEPS OF PRESENTATION. — See METHOD, GENERAL.

FIVES AND HANDBALL. — See HANDBALL.

FIXATION. — The process or state in which both eyes are so set or adjusted that a given point in outer space is imaged sharply on both foveæ and is therefore seen single. Adequate fixation involves, thus, the accommodation (*q.v.*) of each eye, and the convergence (*q.v.*) of both. The point fixated in this way is called the fixation point. Fixation is doubtless made possible by the existence in the retina of a central spot of clearest vision (the fovea) from which peripherally vision becomes gradually less distinct.

R. P. A.

FIXED IDEAS. — False beliefs of a more or less permanent character, sometimes limited to the beliefs called obsessions (*q.v.*), but often used to include all delusions (*q.v.*). The distinction has been drawn that fixed ideas are concordant, so far as the individual knows, with the environment, while obsessions are usually recognized as foolish. This distinction does not always hold, for certain fear obsessions are thoroughly believed in and are considered to be reasonable by those who have them. The classification of fixed ideas follows that of delusions, although most of them have reference to the autopsychic sphere. Examples of fixed ideas are as follows : (*a*) the idea that an individual has a cancer of the stomach, because he has felt what he thinks is an unusual mass on the right side of the body below the ribs ; this idea originated in a fear that he would have cancer because on both the paternal and maternal sides of the family cancer had existed; the idea was dissipated after a careful examination and instruction in the proper location of the stomach ; (*b*) the idea that a fatal kind of heart disease existed, the origin of which idea was precordial distress following indiscretions in diet, cured also by careful examination and the administration of a placebo.

These ideas occupy consciousness to such an extent that they often preclude the pursuit of one's usual occupation and bring about disturbances in digestion and losses of weight. They are often found in children at or about the age of puberty. They are primarily produced by what the individual feels is an abnormal sensation, and they are elaborated by the reading of medical advertisements in newspapers and by the indiscriminate distribution of circulars of patent medicines. S. I. F.

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FLAT. — See Musical Terms.

FLEXIBLE GRADING. — See Grading and Promotion.

FLICKER. — When a series of visual stimulation acts upon the retina at a rate which is too rapid for each stimulation to become fully established in its own character, and yet too slow to produce a fused effect, there is a rapid fluctuation in the quality of sensory experience which is designated as flicker. This flicker is used as the measure of sensitivity, and has significance for the student of sensory processes. C. H. J.

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FLOGGING. — See Punishment, Corporal.

FLOOR SPACE PER PUPIL. — A schoolroom thirty-two feet long, twenty-four feet wide, and twelve and one half feet in the clear between the floor and the ceiling will accommodate forty-five pupils of the lower grammar grades, and forty pupils of the upper grades. This will allow approximately 200 cubic feet of air space per pupil after deducting the amount occupied by furniture, and will permit the desks to be safely arranged with reference to properly placed windows, and at the same time allow ample room for aisles between desks, plenty of room for blackboard workers, and the necessary furniture at the teacher's end of the room. No teacher can do good work in a crowded room; and, what is more important, the pupils themselves need this amount of space for that sense of freedom necessary for undisturbed and unhindered work. In most European countries no uniform norm is accepted. In the primary grades they prescribe much less cubic air space than for the older pupils. This seems to be a mistake, for the following reasons: (1) More unobstructed room is needed for sand tables, and various kinds of manual work in rooms for primary classes than in the higher classes, for such work in the advanced grades is better done in special rooms. (2) More free space is needed in the primary grades for marching, calisthenic exercises, and all other active games and class work than is needed in the upper grades. (3) Little people are more sensitive to bad air, more easily distracted by close neighbors, and need more individual attention from the teacher. Hence the aisles should be correspondingly wider. (4) The children of the primary classes vitiate more air in proportion to size than larger pupils, and hence need comparatively more space. (5) It is false economy to overburden a teacher of the primary grades with too many pupils, and it likewise limits her work too exclusively to book learning.

It is important, then, to hold approximately to this standard, especially by reason of the fact that forty-five pupils are enough for any teacher to manage successfully. A few years ago much more was made of the amount of space per pupil from the point of view of ventilation. But with any satisfactory mechanical system of ventilation, sufficient fresh air can be furnished, even for a room much more crowded than the plan suggested above would permit. But when there is a dependence merely on gravity for changing the air in schoolrooms, overcrowding becomes a serious matter.

In warm climates, or during those seasons when the outside air registers but a few degrees lower than that needed in the schoolroom, it will be practically impossible to ventilate a schoolroom in any acceptable way with less than 200 cubic feet of air space available per pupil; and even with windows all favorably placed, it will require the utmost care on the part of the teacher to keep the air passably pure with this allowance of space. Only on the basis, then, of a satisfactory system of ventilation can one with any degree of certainty safely prescribe 200 cubic feet of air space per pupil. Anything appreciably less than this will, for the reasons mentioned, prove unsatisfactory. In insisting on an air space of at least 200 cubic feet per pupil, it is known, as suggested above, that this amount is in excess of that often found in practice, and that prescribed as allowable by many European authorities. But it should be insisted that with the growth of a more active personal participation of the child in his school work, and under our form of government, where the children must be trained in coöperative work, this amount of space is not only a conservative estimate, but one which all teachers and school authorities should demand as a minimum.

F. B. D.

See Architecture, School; Air of the Schoolroom; Desks; Hygiene, School.

FLORENCE, ROYAL INSTITUTION OF HIGHER STUDIES, ITALY. — In spite of the general progress and wealth of Florence, it was not until 1349 that a papal bull sanctioning the establishment of a *Studium Generale* was obtained. Attempts had been made in

1321 to secure the professors of the University of Bologna, but without success. The university, however, never really attained to much importance. While much money was devoted to salaries, the teachers could not be induced to stay, nor could the students be attracted to a town which did not offer the same facilities for cheap living as other university towns. The faculties of law and theology flourished intermittently. During several periods the university was entirely suspended, as in 1354–1357, 1378, and about 1412. In 1360 Leontius Pilatus lectured on Homer; in 1373–1375 Boccaccio (*q.v.*) held the chair in poetry and lectured on Dante; and in 1396 the first chair in Greek in any university was held by Chrysoloras (*q.v.*). In 1388 new statutes were drawn up for a reorganized institution. The university continued until 1473, when it was decided to transfer it to Pisa.

The present institution was established in 1859. It has faculties of philosophy, natural and physical sciences, medicine, and pharmacy. The number of students in 1910–11 was 482, a little more than half being in the faculty of medicine.

FLORIDA STATE COLLEGE FOR WOMEN, TALLAHASSEE, FLA. — Established in 1905 by the state of Florida. A graduate school, college of arts and sciences, normal school, and schools of art, music, and expression are maintained. Admission to the college is granted upon certificate or examination, amounting (after 1913–14) to 14 units. The requirements for entrance to the normal school are the work of the eight grades. The college offers six groups of studies, leading up to the A. B. and B. S. degrees. There is a faculty of twenty-five members.

FLORIDA, STATE OF. — Ceded to the United States by Spain in 1819; organized as a territory by Congress in 1822; and admitted as the twenty-seventh state in 1845. It is located in the South Central division, and has a land area of 54,240 square miles, being about the size of New York and New Jersey combined. For administrative purposes it is divided into forty-six counties. In 1910 Florida had a population of 751,139, and a density of population of 13.8 per square mile.

Educational History. — Excepting possibly some Spanish mission schools, nothing was done toward the establishment of schools in Florida until 1831. In that year the Florida Educational Society was formed, the object of which was to diffuse information on the subject of education and to secure the establishment of a school system for the territory. In the same year the Governor was authorized by law to appoint three commissioners to examine into the need of education and to report upon a system of schools suited to the needs of the territory. A ladies' educational society was also formed to further the movement for schools, and much interest in education was awakened. In 1832 a Fellenberg Manual Labor School was provided for at Tallahassee, and a common school at St. Augustine. The latter reported 137 pupils in attendance in 1832, but the school soon closed and the movement for schools died out. In 1835 the Registrar of the land office was instructed to select and secure "the various lands granted by Congress for schools, seminaries, and other purposes." In 1839 the first school law was enacted. This directed that three trustees should be elected in each township to care for and lease the sixteenth section lands, and to apply the income to the support of schools. Many townships at this time did not have a single inhabitant. In case schools did not exist, the trustees were to organize and support them. In 1843 the sheriffs of the counties were given the duties previously given to the trustees, and with special instructions to look after the education of the children of the poor. In 1845 these trustees were directed to report annually to the probate judges of the counties, who were to act *ex officio* as superintendents of schools. The judges were to consolidate the returns and forward them to the Secretary of State who was to lay the results before the General Assembly. No taxes were levied, nor were the schools free, except to the poor.

The first constitution of the state made no provision for education other than to direct that the lands given by Congress for the benefit of schools and institutions of learning should forever be devoted to that purpose alone. In 1849 the first school law after the admission of the state was enacted. This provided for the establishment of common schools for white children, and directed that the five per cent received from the United States for the sale of lands within the state, all escheated estates, and all property "found on the coast or shores of the state" should be added to the school fund. In 1850 the Registrar of Public Lands was made *ex officio* State Superintendent of Common Schools, and the counties were authorized to levy a county tax of a maximum of $4 for each child of school age. Only two counties ever availed themselves of this law. In 1852 the city of Tallahassee was allowed to levy a city school tax to help support its own schools; and about this time the sixteenth section funds, heretofore belonging to the townships, were consolidated by permission of Congress into one state fund for the benefit of the children of the state as a whole. In 1852 the East Florida Seminary was established at Ocala. It was opened in 1853, and in 1866 was removed to Gainesville. In 1856 the Florida Institute at Tallahassee was accepted by the state as the West Florida Seminary. Both of these institutions were established from the seminary lands granted by Congress at the time of the admission of the state. By the school law of

1853 the apportionment of the school fund within the counties, then amounting to thirty cents per school child, was given to the County Commissioners, who were made *ex officio* a County School Board and were authorized to add to the sum received from the state "any sum which they may deem proper to be paid out of the county treasury." Only two counties ever made any appropriation, and the state money was commonly used to subsidize private schools and private teachers. After this law nothing further was done toward the establishment of a system of free public schools until 1869. The census of 1840 showed that there were eighteen academies and grammar schools, and fifty-one primary schools in the state; in 1850 there were ten academies and sixty-nine common schools; and in 1860 there were ninety-seven common and public schools, 138 academies and private schools, and the total state income for educational purposes was $75,412. Of this amount $22,386 was derived from the school fund income. The Civil War put an end to all of these efforts, and the permanent school fund and the seminary fund were both spent for "arms, ammunition, and other purposes" connected with the Confederacy.

The constitution of 1865 merely repeated the provision of the constitution of 1838 regarding the preservation and use of the school lands, but the constitution of 1868 made full and definite provision for a free state school system for the benefit of all. An *ex officio* State Board of Education was created; the Governor was required to appoint a State Superintendent of Public Instruction for the state and a county superintendent of common schools for each county; the legislature was instructed to provide a uniform system of common schools and a university, and to liberally maintain them, and in these tuition was to be free and the schools equally open to all; the sources of the school fund were enumerated and increased; a state tax of not less than one mill, a poll tax, and a county tax equal to at least one half the amount received from the state were to be levied for the maintenance of schools; and a three months' school was to be maintained in each school district of the state. The school law of 1869 carried these constitutional provisions into effect, and not only marks the beginning of free public schools in Florida, but also laid the foundations of the present school system. Progress under the new law was discouragingly slow for some years. There was an apathy engendered by long years of neglect, and there were few teachers and fewer schoolhouses. The best schools during the first decade under the new system were those aided by the Peabody Fund. About 600 schools had been organized by 1874, and by 1880 there were 1504 public schools, and an expenditure for public education of $172,178, or about $3 for each child enrolled. The first teachers' institutes were held in 1879, and in 1886 a State Teachers' Association was organized. In 1880 the East Florida Seminary organized a normal department for the training of teachers; in 1883 the Florida State Agricultural College was opened at Lake City, and the State Blind and Deaf Institute at St. Augustine. In 1885 a new constitution was adopted, which made certain changes in the school system. The State Superintendent of Public Instruction and county superintendents of public instruction were now to be elected instead of appointed by the Governor, and the salary of the State Superintendent was cut in half; the Governor and the State Treasurer were added to the State Board of Education, and the board was given power to remove school officials for cause, to manage the school funds, and to supervise the "schools of higher grades" in the state; the State School Fund was still further enlarged; a county school tax of not less than three nor more than five mills was required; a county school fund was created; school districts, city and town districts separate from the county, and district taxation up to three mills were authorized; the instruction of white and colored children in the same school was forbidden; and the legislature was directed to establish one or two normal schools at its first session. This new constitution, with the subsequent legislation, founded the present school system. In 1887 a normal school for colored teachers was established at Tallahassee, which in 1891 became the Florida State Normal and Industrial College for colored students. A normal school for white teachers was established at De Funiak in 1887. In 1889 the legislature abolished the trustee and district system; reduced the county boards from five to three members each; and gave to the county board of public instruction the employment of teachers and the control of the schools of the county. In 1893 county boards were made elective, the uniform examination law for teachers' certificates was passed, and a bill providing for state aid ($50,000 per year) for high schools and a standard state course of study for high schools and for common schools was enacted. In 1894 the state constitution was amended so as to provide for the distribution of the state school fund to the counties on the basis of average daily attendance instead of school census, and in 1904 the constitution was still further amended so as to raise the maximum limit of county taxation from five to seven mills. In 1907 county superintendents were given a definite salary by law, varying from $600 to $2400 a year; the state aid to high schools was increased to $65,000 per year; $60,000 per year was appropriated to extend the term two months in those schools having an average daily attendance of 80 per cent of the average monthly enrollment; and $40,000 to extend the term one month in all schools not receiving aid under any other provisions.

Present School System. — As at present organized, the school system of Florida is as follows. At the head of the system is a Superintendent of Public Instruction, elected by the people for four-year terms, and an *ex officio* State Board of Education. The Superintendent has "general oversight, charge, and management of all matters pertaining to public schools, school buildings, and grounds" in the state. He calls the county superintendents together in conventions; holds teachers' institutes and engages instructors for the same; apportions the state school money to the counties; prepares the questions for county examinations, and holds examinations for state certificates; nominates persons to fill vacancies in county boards of education; prepares forms and blanks, and makes an annual report to the Governor. The State Board of Education has the management of all school lands and the investment of all school funds; acts as a court of appeal on disputed school questions; may remove any subordinate officer in the schools for incompetency, neglect of duty, or other sufficient cause; and fills all vacancies in county boards of education until the next election.

For each county there is a county superintendent of public instruction, elected by the people of the county for four-year terms, and a county board of public instruction consisting of three members elected for two-year terms, one from each of the three school board districts into which each county is divided. The county superintendent is required to inspect the schools and to advise with parents and school officers; to keep records of each school; to decide disputed school questions; to look after school buildings and funds; to conduct teachers' examinations and issue county certificates; to report the collection of poll taxes and to take the school census; to act as secretary and executive officer of the county board of public instruction. These boards in each county hold the title of all school property, except in special-tax districts; select school sites and locate schools as needed; employ teachers, and pay them for their services; appoint one supervisor for each school, on the recommendation of the patrons and the nomination of the county superintendent; do whatever is necessary in their judgment to advance the interests of the schools in their charge, possessing large discretionary powers in this matter; may establish high schools; must make a monthly and an annual financial report to the county clerks, and an annual report to the State Superintendent; select and adopt a uniform series of textbooks, and prescribe a uniform course of study for the schools of their respective counties; estimate and levy the amount of county school tax needed to conduct the schools for the ensuing year; appoint a county grading committee of three teachers to assist the county superintendent in conducting teachers' examinations; fix the time for the opening of the schools of the county; order elections for the creation of special-tax districts; and subdivide each county into three approximately equal school board districts for the election of members of the county board of public instruction, and alter the boundaries of the same. The patrons of each school recommend, the county superintendent nominates, and the county board of public instruction appoints one supervisor for each school in the county, special-tax districts excepted, whose duties are to supervise the work of the school and to report monthly to the county superintendent. This is all that is left of the district system of school administration in the state, except in special-tax districts.

By a petition of one fourth of the taxpayers and an affirmative vote of a majority of the votes cast at a special election called for the purpose, any city, town, community, or subdivision of the county may organize itself as a special-tax district to be governed by three trustees, elected for two-year periods. The board of trustees, so elected, supersedes the supervisor, but the schools still remain under the control of the county board of public instruction. The trustees in special-tax districts are given power only to nominate teachers to the county board for appointment; to expend all special tax raised by them in any equitable manner they may deem best; to estimate the rate of special tax to be voted for the ensuing two years; to admit outside children to the schools; and to supervise the schools and report to the county superintendent and county board.

School Support. — The state originally received 908,503 acres of land from the 16th section grants made by Congress to the states for common schools, and four townships of land (92,160 acres) for two seminaries of learning. A portion of this was sold before the war, but the proceeds of such sales were lost in the struggle. About one third of the 16th section land is still on hand, and is classed as unproductive land, not under lease, without any value attached to it. The total permanent school fund of the state, at last report, was $1,129,667. The interest on this, together with a state one mill property tax, is apportioned to the counties on the average daily attendance of the preceding year. Each county is required to levy a county tax of not less than 5 mills, and a poll tax of $1, to be added to the fund received from the state. The average county tax levied in 1909–10 was 6.84 mills, thirty-two of the forty-six counties levying 7 mills, the lowest tax levied being 5 mills. Special-tax districts, of which there were 466 in 1908, may also levy additional taxation up to 3 mills. The state also makes additional appropriations of $65,000 annually in aid of high schools; $60,000 annually in aid of all common schools, attaining an average attendance of 80 per cent on the total term enrollment; and $40,000 annually to be apportioned to the counties in proportion to their property valuation, to extend for one month the schools not receiving aid under either of the two plans just mentioned. The total state contribution in 1906–1907 was equal to 13.65 per cent of the total sum raised.

Educational Conditions. — Of the population of 1900, 43.6 per cent were negroes, and 95.5 per cent were native born. In twelve counties the blacks outnumber the whites, and in two counties they outnumber the whites four to one. The percentage of illiteracy in Florida (21.9 per cent), according to the Federal census of 1900, was somewhat lower than that for the other Southern states. For the two races the figures were 8.9 per cent for the white and 38.4 per cent for the black. The average value of land, furniture, equipment, and schoolhouses of the state is about $1000 each, which is also higher than is the case in neighboring states. For buildings alone the average value is approximately $800 for white and $300 for black schools.

The rural schools are but partially graded. Manual training is not listed as taught in any city or town in the state. Rural graded schools, which prepare pupils for the high school grades, are now being developed in many places.

Teachers and Training. — According to the statistics furnished, the negro teachers are a more permanent class than the white teachers, the average teaching experience of negro males being seventy-nine months as against fifty-two months for white males, and forty months for negro females as against thirty-six months for white females. Seventeen per cent of the white teachers and 19 per cent of the colored are graduates of normal schools. For the training of new teachers the state maintains the State Normal and Industrial School at Tallahassee for negro teachers, while the educational department of the University of the State of Florida and the normal department of the Florida Female College serve as normal schools for the white race. In addition, the state maintains two summer schools of two months each for the instruction of white teachers, and one summer school of six weeks for the instruction of colored teachers. For the maintenance of these summer schools the state makes an annual appropriation of $4000, and $2500 additional to pay the traveling expenses one way of all teachers or prospective teachers attending these schools. The teachers' institute, with required attendance of all teachers, as known elsewhere, has not as yet been made a part of the state school system. Voluntary teachers' associations are held, and these enrolled one sixth of the white and one seventh of the colored teachers.

Secondary Education. — Since 1903 the state has offered aid, as noted above, to rural graded schools, and to junior (two-year) and senior (four-year) high schools. Rural graded schools, as defined, must be located in towns of less than 500 inhabitants, or three or more miles from any town or city of over 500 inhabitants. Two public high schools and three denominational institutions offer secondary instruction for the colored race. Many of the high schools are combined grammar and high schools.

Higher and Technical Education. — The University of the State of Florida, at Gainsville, for men, and the Florida Female College, at Tallahassee, for women, stand as the culmination of the public school system of the state. The former now embraces the Agricultural and Mechanical College, formerly located at Tallahassee. The Florida State Normal and Industrial School, at Tallahassee, offers mechanical and agricultural instruction for the colored race. The state also maintains the Florida Institute for the Blind, Deaf, and Dumb at St. Augustine. In addition to the state institutions, two private and denominational institutions offer work of collegiate grade. E. P. C.

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FLORIDA, UNIVERSITY OF, GAINSVILLE, FLA. — An institution established by act of legislature in 1905, which established at the same time the Florida State College for women and abolished the Agricultural College at Lake City (founded in 1884, and from 1903 to 1905 known as the University of Florida), the Florida State College at Tallahassee (*f.* 1856), the Normal School at De Funiak Springs, the East Florida Seminary at Gainesville (*f.* 1852), the South Florida College at Bartow, and the Agricultural Institute in Osceola County. A sub-freshman class is also maintained. The entrance requirements to the full courses are equivalent to twelve points of high school work, and admission is by examination or certificate from an accredited high school. Six courses are offered, leading to the degrees of A.B. in arts and pedagogy, B.Sc. in general science, engineering, and agriculture. Short two-year courses are provided on a basis of the common school branches. The university is under the supervision of a Board of Control, and is maintained out of state appropriations, and the income of the Agricultural College Fund, the Morrill and similar funds, and the East Florida Seminary Fund. The student enrollment in 1909–10 was 186. There is a teaching staff of forty-six.

FLORIO, JOHN. — Writer of Italian textbooks in England; born about 1553, was the son of Michael Angelo Florio, preacher to the Italian Protestant refugees in London, 1550. It was of this church that Roger Ascham spoke in the *Scholemaster*, when he condemned courtiers for attending the service only to hear the language and not for devotional purposes. John Florio's father taught Italian in London. He translated a Latin Catechism into Italian, 1553 (?) and wrote in Italian a life of Lady Jane Gray. But it was his son John who is especially to be connected with systematic teaching of Italian in London. John Florio was probably educated first on the Continent, and then entered Magdalen College, Oxford, in 1581. He was connected with the household of the Earl of Southampton, and had been tutor in foreign languages to Robert Barnes, son of the Bishop of Durham (Einstein, *Italian Renaissance in England*, p. 102). Florio was teacher of languages to the young Prince Henry, son of James I. He became reader in Italian to Queen Anne (wife of King James I) in 1603. Florio was married to the daughter of Samuel Daniel, the poet. Florio is best known by his translation from the French of Montaigne's *Essays* in 1603. But he especially aspired, as he says himself, to do for Italian in England what Sir Thomas Elyot and Bishop Cooper had done for Latin, and what the Estiennes had done for Greek, and with this end before him compiled *A Worlde of Words: a most copious and exact Dictionarie in Italian and English*, Lond. 1598. The second edition was entitled *Queen Anna's New World of Words*, and was published in 1611. The third edition was revised by Giovanni Torriano and published in 1659 — with an English-Italian part added by Torriano. Florio's other Italian textbooks were *First Fruites, which yielde familiar speech, merie proverbes, wittie sentences and golden sayings, also a perfect Introduction to the Italian and English Tongues*, Lond. 1578. *Second fruites to be gathered, of twelve Trees of divers but delightsome tastes to the tongues of Italian and Englishmen. To which is annexed his Garden of Recreation, yielding six thousand Italian Proverbs.* Italian and English, Lond. 1591. The latter part was also published separately in Italian as *Giardino di Recreazione*, Londra, 1591. The method of teaching by proverbs is paralleled by John Clarke (*q.v.*) and Erasmus' *Adages*, and was thus a recognized teaching method of the times. F. W.

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FLOWER CULTURE. — See GARDENS, SCHOOL.

FLUCTUATION OF ATTENTION. — Whenever one attempts to hold an experience, either sensory or ideational, steadily in consciousness, he experiences a succession of wavering intensities. At one moment the experience is vivid and intense; a moment later it is less intense, frequently disappearing entirely from consciousness. For example, if an observer looks steadily at a faint light, it will be seen to come and go. This fluctuation is due to a series of retinal conditions which arise during the progress of the stimulation. Pillsbury distinguishes between fluctuations in organs of sense, illustrated in the last example, and fluctuations of attention. The latter are, according to his experiments, somewhat slower than the fluctuations in sensory processes. For the most part sensory fluctuations and fluctuations in attention have been regarded as identical in type. Both have been traced to the inability of nervous tissue to continue indefinitely its activities. When the retina stimulated by constant light reports to the central nervous system varying intensities of sensory excitation, this is held to be due to the intermittent activities of nervous tissue. In the same way when one attempts to hold an idea vividly before his consciousness, but fails to do so with complete success, it may be assumed that his central nervous tissue, like the sensory tissue, is incapable of indefinite activity at the same level of intensity. C. H. J.

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FOLKLORE. — The science of folklore, if science it is, has the unusual distinction of bearing an English name. The general custom of the English language from the beginning has been to give names of Latin and Greek origin to scientific studies, such as the older names astrology, mathematics, etc., and the names of the newer sciences, biology, sociology, anthropology, etc. The native name of the science of folklore is suggestive both of the origins of the science and of the reasons why its standing as a science has been frequently called in question. The science owes its origin to the world-old interest which the more inquiring among men have always felt with respect to the habits and customs of the society of which they were members. The study gives expression to a general popular interest, and therefore appropriately has taken a generally intelligible English name. This popular interest in social custom and tradition has seldom been developed, however, with any approach to rigid scientific method. Every one observes social custom with a certain degree of intelligence, but few take the trouble to test their own observations in a critical spirit or to weigh the evidence upon which the reported observations of others are supposed to be based. It results consequently that much of the material in folklore research is gathered with an easy credulity that makes it altogether unreliable as ground for scientific generalization. That this weakness of much so-called research in folklore is not inherent in the subject, but is due to the untrained character of the popular observer is sufficiently proved by much work that bears the test of the most rigid standards of scientific method.

As a branch of scientific research, folklore may be regarded as one division of the general science of anthropology. Its specific definition has been given as " the science of tradition," and tradition, in the sense in which the term is here used, means " the whole body of the lore of the uneducated. It thus includes customs and institutions, superstitions and medical practice, and many other things besides stories." (E. S. Hartland, *Folk-lore, What is it and what is the good of it?* pp. 6–7.) The material of folklore is thus seen to be made up of popular narrative, such as expresses itself in myths, epic, romance, and legend, of customary practices, such as the observance of funeral or marriage rites, of baptism and the thousand other traditional customs of society, of superstitions, reasonable and apparently unreasonable, like the superstition of the evil character of the number thirteen or the power, benevolent or malevolent, of supernatural beings, etc. It is limited to the lore of the " uneducated," because it is mainly in the life of this class that traditions arise and are developed in a natural and untrammeled way. The tendency of higher and more artificial forms of society is to cast discredit upon popular tradition and to introduce an element of consciousness which is destructive of the naïve self-revealing character of genuine primitive traditions.

Such being the materials of the science of folklore, the purpose of it is to determine by means of extended and comparative study the general mental characteristics which are the common possession of the human race. " The human mind, alike in Europe and in America, in Africa and in the South Seas, works in the same way, according to the same laws. And the aim of the science of tradition is to discover those laws, by the examination of their products, the customs and beliefs, the stories and superstitions handed down from generation to generation, to ascertain how these products arose and what was the order of their development, and so to coöperate with physical anthropology and archæology in writing, as it has never yet been written, the history of civilization." (Hartland, *ibid.*, pp. 7–8.) The sources of the material for the science of folklore are found first of all in the traditions of " uncivilized " peoples, for here primitive traditions are most likely to persist with the least artificial and extraneous addition; secondly, in the traditions of the " uneducated " portion of civilized societies, where popular customs are least subject to critical examination or to corruption by contact with literary and learned practices; and finally, in the survivals of genuine primitive traditions which linger in the social customs even of highly civilized peoples, for example, many of the rites of baptism, marriage, and burial current in conventional societies.

As a separate subject, apart from the general sciences of anthropology (*q.v.*) and ethnology, folklore has as yet found no place in the academic curriculum of colleges and universities. Much of the attention which is given to the origin and growth of early traditional literature, the myth, the epic, etc., and to the explanation of early ritualistic and gnomic literature, properly comes under the head of folklore, but is not so designated in the classification and organization of academic courses in these subjects. As a field of research in itself, folklore has been most zealously cultivated by the non-academic public, especially through the organization of folklore societies. The Folk-Lore Society of London has issued numerous publications since the year 1878, and is still active. The American Folk-Lore Society, with headquarters in Boston and with many branch societies, since the year 1888 has issued many interesting and important numbers of its *Journal of American Folk-Lore.* Owing to the facts that the materials for observation are accessible on all hands and that no technical methods are necessary for the gathering of these materials, the study of folklore has been prosecuted with zeal and intelligence by a large body of popular investigators.

Apart from its scientific interest as a branch of the science of anthropology, the study of folklore is of educational significance mainly in connection with the elementary school. The subject is obviously not one to be taken up in any formal manner in the elementary school; but a knowledge of some of its methods and purposes is implied in the use of much of the narrative material now employed in elementary instruction. Popular traditional narrative is peculiarly suited to the mental needs and capabilities of children before they are prepared to appreciate the more subtle and refined works of conscious literary art. The child, repeating in some degree the history of the race, understands and enjoys what the race has produced in its own primitive childhood. Beginning, therefore, with the earliest anthropomorphic fables and animal stories, and passing down through the myths and fairy tales of the race, the hero tales, which form the material of early epic and legendary narrative, and the more idealistic romances of the tales of adventure and chivalry, the child reviews in succession the great motive forces, in their simplest and broadest expression, which gave life and energy to man's earliest literary impulses, and which, to a large extent, still continue to give life to all the products of the literary imagination. (See Culture Epoch.) In general it will be found that the more popular and unliterary the form of a traditional narrative, the more picturesque and interesting, both in phrasing and in content, it will be. It has very rarely happened that a literary revision of a genuine popular narrative has improved it, so far, at least, as its presentation to children is concerned. The best the literary reviser can do is to transcribe, as Grimm did in his *Märchen*, the form of the story which has been worked out in the practical school of popular experience. In this connection attention may also be drawn to the fact that the popular origin and evolution of traditional narrative does not necessarily imply a low degree of art in such narrative. The methods of popular narrative are as exacting as those of written literary art, and a story, formed and elaborated by many successive generations of traditional telling, may have reached a final and perfect form, which, if it can be caught in its genuine popular form, is not to be improved by conscious artistry. The mere writing down, as in the case of Homer and the other great epics, is an accident of circumstance, and has little to do with the creation of the narrative itself.

The forms of folk tales most frequently used for purposes of instruction in the teaching of elementary students are myths, .fairy tales, and fables. Stories of the first kind, in which there is usually a narrative of human events involving supernatural persons and expressing a traditional, popular conception of natural phenomena (such as the Apollo myths), or of historical or supposedly historical events (such as the Trojan wars of Homer), are widely distributed among all peoples. They are obviously related in their origins and development to the growth in religious thought and in national self-consciousness of the peoples whose life they respectively express. Most of the great epics of the world have a mythical foundation, a strong mythical element.

The fairy tale, on the other hand, differs from the myth mainly in that its interest is not so comprehensive, so epic. Supernatural characters also appear in the fairy tale, but here these characters are the minor deities, the *genii loci*, of more distinctively popular tradition. The fairy tale, moreover, has frequently bound up with it many of the characteristics of the popular folk tale, such as moral teaching, animal transformations, ingenious plot, and droll situation. If the myth be characterized as the product of primitive imagination, the fairy tale may be described as the product of primitive fancy.

The third type of folk tale, the fable, as the term "fable" is now used, comprises short stories containing moral lessons in which the actors are either altogether or partly animals or inanimate objects of nature. The ultimate origin of stories of this kind as survivals of primitive animism seems probable. Historically, however, the great body of fable literature can be traced back to two sources, Greek and Indian, from which it has been diffused throughout the nations of modern Europe. Among the early Romans of the south of Europe and among the Teutonic peoples of the north there was no traditional fable material of native origin. The two sources from which the great body of European fable literature has been derived are, first, the Greek fable, which was developed as early as the sixth century B.C., at which time Æsop (*q.v.*), according to the testimony of Herodotus, lived. It is not to be supposed that Æsop invented the Greek fable, which bears all the marks of a traditional folk tale, but it has been plausibly surmised that Æsop became the name to which the floating literature of popular fable attached itself because Æsop applied this popular fable literature to a new purpose, namely, to the discussion of political matters when free speech was dangerous under the Greek tyrants. That the Æsopic fable was an independent development in Greece seems to be adequately established, though later the original stock of Greek fables was largely increased by borrowing from the Indian fable.

The main applications of the Indian fable were religious. Originating, like the Greek fable, in folk tales of animistic coloring, the development of which was greatly encouraged by the Oriental belief in metempsychosis, the Indian fable was utilized in the popular religious instruction of the Buddhists very much as the lives of the Saints were used by the medieval Christian preachers. These stories were gradually collected under the name of *Jataka*, or stories of the Buddha's former births; and each tale consists of a story of the past, *i.e.* of the former birth, and a story of the present, from which the story of the past arises by suggestion, and the whole concludes with one or several moral statements summing up the teaching of the story. Collections of this nature assumed various forms in the East, the most important, after the *Jataka*, being the *Panchatantra*, the *Hitopadesa*, and the *Kalilah and Dimnah*. The history of these collections, of their combination with the body of Greek fable, and of the diffusion of this general collection of Indian and Greek fable would be the history of by far the greater part of the fable literature of medieval and modern European literature. G. P. K.

See Anthropology; Culture Epoch Theory; Fables; Literature, Children's; Story Telling.

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FOLK PSYCHOLOGY. — This term refers, when used in a strict sense, to the body of scientific knowledge which has been accumulated with regard to the special mental traits of definite communities or tribes. In a somewhat more general sense it is used as a synonym for social psychology (*q.v.*). C. H. J.

FOLK TALES AND FOLK LITERATURE. — See Folklore.

FOLLEN, CHARLES (1796–1840). — Author of the earliest texts prepared in America for the study of German in schools; was educated in Germany, and was eleven years an instructor and professor in Harvard College. His German readers and grammars were published from 1826 to 1835. W. S. M.

FOOD AND FEEDING OF SCHOOL CHILDREN. — **Nutrition.** — In the feeding of school children there should be intelligent coöperation between parents and teachers, between the home and the school. Proper nourishment is an essential condition of efficient school work. The primary responsibility rests upon the home, but under modern conditions the school has a duty in this matter, also. Even where the school has no share in the actual feeding of children, it can nevertheless often have an influence by advice and suggestion. Parents should have an elementary knowledge of common foods and their composition in order to regulate their children's diet intelligently and provide wholesome school lunches. They should know that there are three main classes of food: first, those rich in proteins — lean meat, eggs, fish, milk, and the like; second, the so-called fuel foods, the various carbohydrates — cereals, bread, potatoes, cake, sugar, preserves, etc., together with the fats; and third, those foods which consist chiefly of water — green vegetables, oranges, tomatoes, and the like.

The question of just how much food is needed by children at different ages and what proportion of protein, fat, and carbohydrates should be provided is not settled. Many estimates have been made. An American standard by Atwater is as follows for an adult engaged in moderate muscular work: 125 grams of protein and 125 grams of fat, and 450 grams of carbohydrates, with a fuel value of 3520 calories.[1] Children of six to nine are supposed to need about half as much. Camerer approves the estimate of Sommerfeld, according to which children between five and eleven require on an average per day the following amount of food: —

Age	Protein Grams	Fat Grams	Carbohydrate Grams
5–7 . . .	50–58	30–43	145–197
8–10 . . .	60–88	30–70	220–250
10–11 . . .	68–86	44–85	211–270

Dr. C. F. Langworthy has estimated the amount that children and adults in this country actually do eat as follows: "The average adult in the United States is daily supplied with 100 grams of proteins, 150 grams of fats, and 350 grams of carbohydrates, with a total fuel value of 3240 calories." He finds that "children of from 2 to 5 years of age eat about four tenths of this amount, and those between 6 and 9 eat five tenths of it, while girls and boys of from 10 to 12 years take from six tenths to nine tenths."

Just how much this amount of food would be translated in terms of daily life Miss Hunt has attempted to illustrate roughly by the following day's menu for a child six to nine years of age. Breakfast: orange of medium size; cooked oatmeal, one third cup; milk and cream mixed, one half cup; toast, one slice; butter, one half cubic inch; milk to drink, one glass. Dinner: white fish, three ounces as purchased, or one and one half edible portion; potato, one small; celery, cooked in milk, three eighths cupful; bread, one slice; butter for bread and potato, one cubic inch; rice pudding, one half cupful. Supper: egg; toast, one slice; butter, one half cubic inch; milk, one glass; prunes, three, cooked with one half level tablespoon of sugar; cookies.

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[1] The calory, the standard unit of heat energy, is the amount of energy required to raise the temperature of one kilogram of water one degree centigrade.

Children, of course, need food not merely to supply the necessary bodily heat and the energy expended in muscular exercise, but also to supply the needs of growth. Nitrogen is an essential condition for the repair and building up of new tissue; hence a certain amount of nitrogenous food or protein is necessary. Probably, however, even a growing child does not need a high protein diet. While it is well for children of school age to eat meat, fish, eggs, and the like, there is little danger, with an abundant supply of milk and a variety of food, that a child will not have protein enough. It is necessary, however, that a child should have plenty of bread, cereals, fruit, and vegetables every day. It is well to keep in mind nature's lesson in regard to the relation of protein to growth. It is a well-established fact that children nursed by their own mothers thrive best. During the first year of life such children grow at a very rapid rate, usually doubling their weight long before the first year is completed. This astonishing growth is accomplished with a remarkably small amount of protein; for recent analyses show that human milk contains only about 1.5 per cent of albumin, far less than that of most other mammals, less than half that in cow's milk. It is not a question of the amount of protein eaten, but rather of what is digested and assimilated. The total amount of protein given in the above estimates is quite ample. As regards fat and carbohydrates, it is not necessary to have the exact quantities mentioned. If a sufficient total amount is provided, the proportion of the two kinds of food may be left largely to taste. And in general it should be remembered that the standards given are merely estimates based upon our present scientific knowledge. No rigorous norms have as yet been established.

Atwater's two general rules should be printed in italics for all that have to do with the diet of school children: (1) "to choose the foods that 'agree' with them, and to avoid those which they cannot digest and assimilate without harm; (2) to use such sorts and quantities of foods as will supply the kinds and amounts of nutrients needed by the body, and yet to avoid burdening it with superfluous material to be disposed of at the cost of health and strength."

Keeping in mind these elementary facts, the following hygienic principles should be emphasized: (1) It is desirable that children of school age should have a variety of food. It is usually better for them to eat eggs, milk, fish, meat, fruit, vegetables, cereals, and the like, than to be restricted in their diet to a few articles. (2) There should be the greatest cleanliness in all food for children. This is of fundamental importance. Infant morbidity and mortality would be enormously decreased, as shown by recent studies, if it were possible to supply children with clean milk. Among children of school age, also, a vast amount of disease would be averted if cleanliness could be made universal. This is a very difficult task; for even if the food be clean, children are apt to have dirty hands; and the fruit vender, the grocery man, and the confectioner are often far from cleanly in their habits, and many temptations are in the way of children. (3) Children should, as a rule, be given food that they like. Modern studies by Pavloff and others show that digestion waits on appetite, that the liking of food stimulates the flow of the gastric juices and aids digestion. The custom of some parents in insisting that their children shall eat great quantities of potatoes, oatmeal, and the like, — things eaten sometimes with disgust, — as a condition of having something that they desire, is usually wrong; and it not infrequently happens that a child has some idiosyncrasy, or the like, which makes a certain kind of food indigestible, and sometimes distinctly poisonous. Even eggs and milk are repugnant or poisonous to some children. (4) Children should be trained to take time for eating and to chew their food properly. Habits of health in this respect should be insisted upon, but they can be developed only by long and careful training. The importance of sound teeth and of dental hygiene for school children can hardly be emphasized too strongly, and suitable nutrition of school children demands training in chewing food and in care of the teeth. (See TEETH, HYGIENE OF.) (5) The food for school children, especially starchy foods, cereals, potatoes, and other vegetables, should be thoroughly cooked.

If the food for children is clean, thoroughly cooked, what they like, and properly chewed, there is little danger of indigestion; but a few words of warning should be emphasized. Stimulating food and drinks, especially alcoholic drinks, should be forbidden. Tea and coffee, which are extensively used by school children, should be prohibited; also rich and highly spiced food, stimulating meat sauces, pastry, greasy foods, fried potatoes and other products of the frying pan, and uncooked or partially cooked starch, whether in pies, gravies, or elsewhere, should be avoided. Since the school child is devoting much of his energy to mental work, he should not be given food difficult of digestion; and, finally, parents should beware of the innumerable fads that are prevalent everywhere in regard to food. Almost every article on our tables has been tabooed by some one; and on the other hand, almost every form of diet has been recommended as a panacea by some cult or individual. Beset by the claims of innumerable breakfast foods, the doctrines of special cults, which advocate exclusively vegetable food or raw food, nuts, fruit, particular cereals, or special predigested foods, or the like, it is wise for the mothers of school children to select a variety of simple foods, and beware on the one hand of those who advocate a given diet merely because it is nutritious, and on the other those who advocate special foods because they are easily digested.

School Lunches. — This is a subject of great theoretical as well as practical importance. The movement for school lunches is typical of a number of hygienic measures that are likely to be opposed by the argument that they represent a socialistic tendency, that they have a pauperizing influence, that they encroach upon the duties and the responsibilities of the home. It is pointed out that it is not the function of the school to feed children, but to educate them. Any form of medical inspection or physical care that goes beyond the mere detection of contagious diseases — which would directly interfere with the special function of the school — is, it is maintained, an unjustifiable and unwise encroachment on the functions and duties of the home. On the other hand, it is argued that good reason can be given for providing school lunches on the ground that the failure to do so does directly interfere with the special function of the school. The argument is also made from a broader point of view. In providing school lunches or medical inspection, or the like, the school is not taking a new and revolutionary step. A revolutionary step was taken when public schools were first provided at state expense. The very same arguments now used against making the school in part responsible for the physical health of children were used by Herbert Spencer and others against the innovation of providing state education. That was the serious new step; it may have been a dangerous one. It is believed that it was wise; and in accordance with this belief it is obviously necessary and consistent to provide the conditions necessary for the efficient performance of the special function of the school. The conditions in the schoolhouse, for example, must be made suitable for the work to be done in it; and it is no more socialistic, it may be argued, to provide the proper internal heat by supplying pupils with suitable food than it is to provide suitable external heat by warming the schoolroom. In fact, the great innovation of providing public education having once been made, there is no logical stopping place short of providing every necessary condition for school work so far as it seems expedient for the public to assume the given functions.

Custom has, however, made the home primarily responsible for the physical welfare of children. The school should assume this function only when it is necessary to supplement the care of the home. In many cases this does become expedient and necessary. The furnishing of school lunches in many places is a case in point. In large cities it is frequently difficult and sometimes impossible for the home to provide properly for the feeding of school children. To say nothing of the poor and the ignorant, even children from the homes of the well-to-do frequently have no suitable midday lunch at home; the parents being away at work, or ill, or overworked cannot prepare it.

The problem, then, is to provide suitable food as a necessary condition of efficient school work, and at the same time to avoid weakening the responsibility of the home, pauperizing the poor, or in any way developing thriftless habits. This problem has with much promise of ultimate success been temporarily solved by the plan adopted in New York and several other large cities of providing school lunches at cost. It has been found possible to provide a wholesome lunch for a few cents, and by coöperation with the homes the small amount of money necessary for buying the lunch can usually be given to the children; and where this has not been possible, it has been found feasible to provide meal tickets by charity and privately without the knowledge of the other children.

The experiments already tried with this plan of furnishing school lunches at cost seem to indicate the feasibility of it for American conditions. In Indianapolis under the efficient management of Miss Carman, in Philadelphia under the direction of Miss Boughton, and in New York under Miss Kittredge and others, it has proved successful. Similar experiments have been tried in many cities in different parts of the country. The price usually charged is from one cent to three cents; and in Philadelphia, where the menus are planned by an expert dietician, one cent buys at least 100 calories of food value. The food usually consists of soup, sandwiches, milk, fruit, cocoa, hominy, shredded wheat with fruit, graham wafers, rice pudding, cereals, and the like.

No question of this kind can be divorced from the educational problems of the school. The training of the school is quite as important as the instruction given, and a twofold opportunity for training is furnished by the occasion for school lunches. First, there is an excellent opportunity for developing healthful habits. Here children can be naturally taught the care of the teeth, the habit of chewing the food, the danger from flies, cleanliness in regard to food; and the habit of eating a variety of wholesome food can be developed, while in addition a certain amount of instruction in regard to the hygiene of food can be given. Again, the school lunch furnishes an admirable opportunity for a certain amount of social training and the development of the spirit of coöperation. Kerschensteiner's principle of a community of workers, an *Arbeitsgemeinschaft*, can easily be adopted in connection with the serving of the lunch. This incidental training in habits of health and coöperation may be quite as important as any of the instruction given in the school.

In the large cities in this country it is absolutely necessary to furnish school lunches. Thousands of children come to school without suitable food. It is estimated that 35 per cent of the school children in New York City suffer chronically from lack of food. Usually the children have pennies given to them to spend, which without the school lunch they are likely to squander for candy, pickles, or other unwholesome wares from street venders, while with the school lunch they are taught to spend them for much-needed nourishment. To furnish school lunches at cost is no more socialistic than to provide a college commons or a municipal water supply. If in some cases it does become necessary to encroach upon the rights and duties of the home, it should be done in such a way that it will not be permanently necessary. The school children of to-day are to become the parents of to-morrow; and the school should perform this function in such a way that at least in another generation it will not be necessary.

In many European countries school lunches have been provided for many years. In Norway they are provided free and paid for out of the taxes. In France they are served at cost or free to those who cannot pay. W. H. B.

England. — The feeding of necessitous children was for a long time undertaken by voluntary associations out of voluntary contributions. Thus meals were provided in Manchester Board Schools in 1879, and in London such work was organized by voluntary associations in Board Schools, but not through official machinery. After the 1902 Act the provision of meals was left to a Joint Committee on Underfed Children, including representatives of the Council and Education Committee, managers, and two supply associations. In Manchester meals were given in 1903 to children in non-provided or voluntary schools, as well as in Council Schools; and in 1904-05 a charge was made for meals, except in the case of necessitous children. In 1905 the Relief (School Children) Order put the responsibility of feeding children on the Poor Law Guardians, but in the next year by the Education (Provision of Meals) Act (1906) the local authorities were permitted to associate themselves with any committee to provide meals for children, under the title School Canteen Committee; financial aid could be given by local authorities for land, buildings, furniture, and officers necessary for the preparation and service of meals, and where it is found that children are not profiting from their school work through want of food, and funds other than public are not available for the provision of food, the education authority may defray the cost of food out of the rates up to a half-penny in the pound. Many authorities availed themselves of this act, and meals are provided free to children whose home circumstances after inquiry warrant such a course, while others are given meals on payment of a small fee. As a general rule, centers have been established for the preparation and distribution of food, as at Manchester and Bradford, or, as in London, a contract has been let out to caterers. In the early days, the meals were provided in the schoolrooms, and in many cases teachers gave their help voluntarily; but this has been found unsatisfactory, and in Manchester and other places central locations have been provided for the children. In London the provision of meals since 1908-09 is under the supervision of a Children's Care (Central) Sub-Committee, as the Canteen Committee under the Education (Provision of Meals) Act. Further local care committees are appointed for each school, which look after the general well-being of the children as well as the provision of meals; there is also a local Association of Care Committees which serves to coördinate the work of the care committees, and in time will form a valuable part of the machinery for dealing with children. In 1908-1909, 166,766 meals were provided in London at 697 schools to 39,632 children.

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FOOTBALL. — The origin of this game is not definitely known. The Greeks and Romans played a game which consisted in kicking a ball according to certain rules; but it was in England that football was developed. There are occasional references to the game in English history from the twelfth to the seventeenth centuries, when its development was checked temporarily by opposition from the Puritans. Up to that time football was a simple and rough game, played mostly by adult men in towns and villages. The game was revived in the early part of the nineteenth century by the boys in the great public schools of England. The boys at Rugby, Harrow, and Eton adopted a running and tackling game, which after a century of modification and development exists to-day as English Rugby Football and American Intercollegiate Football. At Charterhouse and Westminster the boys adopted a kicking and "dribbling" game, which after considerable modification exists to-day under the name of Association or Soccer Football. Various games of football very similar to English Rugby and soccer have been developed. The best known of these are Canadian football, which is a variation of English Rugby; Gaelic and Australian football, which are variations of English soccer.

The history of football in the United States presents three distinct phases. The first phase covers the early days of New England, when the men on Thanksgiving Day amused themselves by kicking an inflated pig's bladder about the back yards of their houses. The second phase covers the years from 1840 to about 1860, when the Yale freshmen and sophomores had an annual football game with "a round ball inclosed in a leather bag." These matches were more like our modern class rushes than a real game; there was so much fighting and rioting that the faculty abolished these annual matches. The last phase begins about 1870, when Mr. D. S. Schaff, formerly of Rugby School, entered Yale College, where he introduced the game of English Rugby football. Other colleges took up the game, and in October, 1873, a convention was held at New York between Columbia, Princeton, Rutgers, and Yale, and a set of rules was adopted. The English and Canadian forms of the game were introduced in many colleges, but in a few years a distinctly American game of football was evolved. The chief characteristics of the American game are: first, the number of players is reduced from fifteen to eleven; second, each player is assigned a particular position with definite duties in offense and defense; third, running with the ball, interference for the runner, tackling, and kicking constitute the main points in the game.

Since 1873, when football was introduced in American colleges, it has been the most popular sport among students, and match games in this sport have attracted larger attendances than contests in other sports. In American colleges the profits from gate receipts in football are sufficient to pay the deficits of ten or fifteen other sports. The following financial report of the Harvard Athletic Association is typical of the situation in most American colleges, except that all the figures are proportionally larger.

Financial Report for Year 1909–1910

Receipts from Varsity football	$88,387.48
Expenses for Varsity football	31,078.81
Profits from Varsity football	57,308.67
Expenses for 24 other athletic teams	58,981.81
Receipts from these athletic teams	40,386.75
Deficit from these other teams	18,595.06

This wonderful popularity of football has been achieved in spite of bitter and persistent opposition. About ten years after the introduction of the game in American colleges, President Eliot of Harvard, in his annual report to the overseers for 1884–1885, says in substance: "In the fall of 1883 the committee on athletic sports decided that football ought not to be played, but as the Intercollegiate Football Association was to reform the game by very stringent rules, they waited until they had seen the rules under the new game. After attending four of the principal games, they reported to the Harvard faculty that 'after deliberate investigation they had become convinced that the game of football as at present played by college teams is brutal, demoralizing to players and to spectators, and extremely dangerous.'' The faculty accordingly prohibited intercollegiate contests in football for 1885. The game was soon restored at Harvard, and continued to grow in favor in colleges and schools all over the country. The critics of the game were never silent; they advocated reform or prohibition of football in college faculties, teachers' meetings, newspapers, and magazines. This condition of affairs continued for twenty years. During that time football gained enormously in popularity with students as well as the general public; but this popularity led to the placing of undue emphasis upon victory, and the inordinate desire for victory, in turn, brought forth many evils such as brutality in play, deceit, trickery, extravagant expenditures, etc.

The season of 1905 marks another epoch in the history of American football. Several influential newspapers had carried on a bitter campaign against the game; President Eliot of Harvard had censured the game in each of his annual reports for a number of years; President Butler had prohibited intercollegiate football at Columbia University after the season of 1905; several minor colleges and many secondary schools had followed the example of Columbia; and a student of Union College had been killed in a football match with New York University. Public opinion was aroused, and representatives from many colleges met to discuss the football situation and take measures to reform or abolish the game. The discussions soon revealed the fact that the great majority of delegates believed in reforming football, and were opposed to any proposition to prohibit the game. The delegates organized the Intercollegiate Athletic Association of the United States (see ATHLETICS, EDUCATIONAL), which gained the confidence of educational administrators, and proceeded to reform the rules governing the game of football, to provide competent referees and umpires for match games, and to carry on a campaign of education for a clean, wholesome game. The results obtained were such that nearly all colleges and schools which had abolished football at the end of the season of 1905 reinstated the game in 1906, and the demands for institutional and state legislation against football were no longer heard. The season of 1909 was marred by an unusual number of fatal accidents. The prohibition of football became again a live question; but again the Intercollegiate Athletic Association succeeded in restoring confidence in football by making an earnest effort to modify the rules of the game in a way to eliminate, as far as possible, the danger of physical injury to the players. The main change made was to modify mass plays, in which the weight and momentum of several players is directed against one or two players, and to encourage an open game with more running and kicking. The season of 1910 showed that the reforms aimed at by the new rules were in a large measure successful. The number of serious accidents has greatly decreased, and the game is more interesting to the players and spectators.

Under the present rules the game of football is played on a field 330 feet long and 160 feet wide. The field is inclosed by a white border line, and whenever the ball goes outside of this boundary, the play ceases until it is returned into the inclosure. There are also transverse lines to assist the officials in measuring the movements of the ball. There is a goal at the middle of the line at each end of the field; it consists of two upright posts exceeding twenty feet in height and placed eighteen feet six inches apart, with a crossbar ten feet from the ground. The ball is an inflated rubber bladder inclosed within an oval cover of pigskin. The game is played by two teams of eleven men each. Each team is made up of a rush line of seven players, — a center, two guards, two tackles, and two ends, — and four backs, a quarter-back, two half-backs, and a full-back. The object in the game is to advance the ball from the center of the field, where it is put in play, until it can be touched to the ground beyond the boundary line at the end of the field. This is called a "touch-down," and counts five points. After a touch-down has been scored, the team making it has the privilege of trying a kick from placement from any point on a line at right angles to the goal line where the touch-down was made. If the ball is kicked over the crossbar and between the goal posts or their projection, it counts one point more. A goal may be kicked by a team in possession of the ball, either by a drop kick or a kick from placement; such a goal counts three points. The only other method of scoring is by a "safety." This is accomplished when a player, having received the ball from a player of his own side, touches it down behind his own goal line. This counts two points against the side making it.

The game begins with the kick-off, the captains having previously tossed a coin to determine the choice of goals. The team which kicks off lines up on the line in the center of the field; their opponents distribute themselves in the territory between their goal line and a line ten yards from the center of the field. The ball is kicked, and the player who catches it attempts to run it back until tackled by a player on the other side. The center-rush then takes the ball, and the teams line up; the quarter-back gives a signal and the center passes the ball back to the quarter-back, who may run with it, but more frequently gives it to one of the half-backs or the full-back to carry it through the line or around the ends. The remainder of the players block their opponents in any effort they may make to reach the runner. The players who run in front and alongside of the player carrying the ball are called interferers, or the interference. According to the present rules a team must advance the ball at least ten yards in three scrimmages or "downs"; if the distance is not gained, the ball is lost and goes to the other side. When a team gains little or nothing in the first two downs, it is customary to kick the ball on the third down, thus losing the ball to the opponents as near their goal as possible.

The most characteristic feature of American football is the advantage in having possession of the ball. This advantage is largely responsible for the roughness of the game because it makes it safer to carry the ball than to pass it or kick it. Consequently, most of the playing consists of bodily contact between the man running with the ball and his interferers on one side and the defensive players on the other side. In English Rugby and soccer the ball is free most of the time, and the players play for the ball instead of the runner, thus involving far less bodily contact than in American football. The attempts made in recent years to lessen the danger of physical injury in football were directed mainly to changing the emphasis from carrying the ball to passing and kicking it.

The game has been made safer than it was, and undoubtedly will be improved still further, but the danger of physical injury cannot be eliminated entirely. The most valuable elements of football would be sacrificed if the game were so modified as to make it as safe as golf or tennis (see ATHLETICS, EDUCATIONAL, for both the value and evils of football). Football is an admirable form of all-round developing exercise, involving, as it does, running, jumping, dodging, pushing, and struggling up and down the field. It develops strength, speed, endurance, agility, quick perception, and rapid decision, in a larger measure than any other sport. The moral qualities developed through participation in football are no less valuable. The many evils that have been associated with the game of football are not inherent in the game; they are all susceptible to elimination, if those in charge of our educational institutions will accept the responsibility which rests upon them for proper supervision. American football under favorable conditions is one of the most valuable agents for the all-round physical, moral, and social development of American boys and young men. G. L. M.

See ATHLETICS, EDUCATIONAL; ATHLETIC FIELD.

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FORBES, PATRICK (1564–1635). — Bishop of Aberdeen; next to Bishop Elphinstone, the founder of the university, the greatest benefactor to education that the Northern University has ever had. He was educated at Glasgow and St. Andrews under his relative, Andrew Melville (*q.v.*), and also at Oxford. He intended to settle on the family estate of Corse, but he showed such aptitude for the ministerial office that he was persuaded to be ordained minister of Keith (1612), although he was then in his forty-seventh year. Six years afterwards (May 17, 1618) he was consecrated Bishop of Aberdeen. It was then that he found his opportunity for proving his administrative abilities as an educationalist. In virtue of his position, he was also chancellor of the university, and he had supreme control in choosing and admitting professors, in disposing of the revenue and directing the studies. He found the condition of the two colleges, King's and Marischal, in a deplorable state. The buildings were falling into ruins, the income was being squandered, and several professorships had fallen into disuse. Even the professors who remained performed their duties in a most perfunctory manner. He set himself at once to have all this remedied. He restored the professorship of divinity in King's College, and founded its salary out of his own private purse. He also instituted a similar chair in Marischal College. He revived an old statute by which regents and teachers of philosophy who had studied under the primarius professor of theology were obliged, after six years, to leave the university and take charges, and so give place to others. By this means he supplied the parishes with learned clergy, the University with distinguished professors, and the city of Aberdeen with the most famous theologians of the day, who gained a world-wide reputation as "The Aberdeen Doctors." D. M.

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FOREIGN LANGUAGES. — See GREEK, STUDY OF; LATIN, STUDY OF; MODERN LANGUAGES IN EDUCATION.

FOREIGNERS IN THE SCHOOLS. — See EXCEPTIONAL CHILDREN; IMMIGRATION AND EDUCATION.

FOREST PARK UNIVERSITY, ST. LOUIS, MO. — An institution for the higher education of women, established in 1861. Preparatory, collegiate, and musical courses are offered. Four years of high school work are required for entrance to the college, which offers the degrees of A.B. and B.S. There are twenty-nine members on the faculty.

FORESTRY EDUCATION. — Forestry, like agriculture, is preëminently an applied science, and therefore its practice is conditioned by the economic needs of the time. While the science of forestry is well developed and rests on a solid foundation of natural sciences, its practical application varies in the different countries in accordance with their economic and political development, and the organization and the scope of the forest schools in the different countries accordingly vary in many essential points.

A long and gradual process separates the present high state of forest science from the few empirical rules which were the entire equipment of the early foresters; the high scientific training of the present-day foresters, which places them at the head of such universities as Giessen, Munich, and Tübingen from that of their prototype "huntsmen," the *Jäger*, whose chief concern was with the chase, the training of dogs and horses, the setting of traps, and shooting, etc., but who, nevertheless, through the exercise of their calling were brought into contact with the forest in such a way as to interest them in its care and preservation.

The progress of forestry and forest education has been dictated by the needs of the time. As long as there was an abundance of forest land, timber was hardly recognized as being of sufficient value to be worth claiming as personal property. There was no need at that time for preserving the forest or prohibiting cutting. On the contrary, the presence of the forest in many cases was a hindrance to the development of agriculture, and therefore owners of woodlands encouraged the clearing of the land by any one who desired to settle on it. This is characteristic of the early history of practically every nation, and is still taking place in the newly settled countries. At such a period the returns from hunting and trapping had a greater value than those from the timber itself. Gradually, as the countries of the Old World became more densely populated, and the forests began to show signs of exhaustion, there arose a need for the care of the woodlands, for the timber they produced, and with that, a demand for men capable of handling them. At first this increase in value of the forests showed itself in a stricter legal definition of the property rights of forest owners, in restriction of forest use, and protection against fire and grazing. In middle Europe this stage was passed early in the eighteenth century, when the Huntsmen's Guilds, into which early foresters were organized, were gradually compelled to give place to the true foresters, better equipped to meet the forest problems of that day. With economic and industrial development, with increased demand for wood, occasioned by a multiplicity of uses throughout the world, the value of forests constantly increases, and there gradually arises the need, not only for protecting the forest, but also for securing its regrowth, either by natural reproduction or by planting. The science of forestry and forest education had necessarily to keep pace with this economic development, and the demand for wood led inevitably to the development of schools for the training of competent woodsmen. In most of the European countries, the forests are managed on the basis of a perpetual sustained yield, which requires the services of an organized technical force. Thus the training required of foresters is on a par with that required of physicians, engineers, and lawyers, and there is now scarcely a country in the world which has not some kind of a forest school.

The best and most thorough organization of forest education is to be found in Germany and its nearer neighbors. The density of population and the comparative difficulty of securing wood supplies abroad forced the Germans to intensive use of the soil and to care for the forest lands. Hence there arose in that country earlier than anywhere else the need for competent men to handle forest properties. Forest education as conducted in Germany is of interest, therefore, not only because it has there reached its highest development, but because Germany has gone through all phases of development which other countries already have passed or will pass, and also because Germany has led the way for most countries in the practice of forestry and in the training of foresters.

Germany. — The beginning of forest education in Germany dates back to the close of the eighteenth century, when a number of so-called " master schools " came into existence. Until the middle of the eighteenth century the care of forests was in the hands of huntsmen, who as a rule were illiterate, and among whom were those who had extended their knowledge through experience beyond that of the ordinary woods craftsman. By working under these self-styled foresters for two or three years others prepared themselves and received a certificate of their training. The first master school was started in 1764, by V. Zanthier, in Wernigerode, and was later transferred to Ilsenberg, a town in upper Saxony, situated within the precincts of the old Thuringian forest. This school ended with the death of Zanthier in 1778. In 1785 Heinrich Cotta established a similar school, which was followed four years later by one under Georg Hartig. These two men have since been recognized as the two great masters and fathers of modern forestry. Cotta's school was later transferred to Tharandt, in Saxony, and changed into a state institution, known since as the Tharandt Forest Academy. Several other " master schools " were later taken over by the State, and changed into higher or middle schools of learning under the name of academies. In 1770 the University of Berlin began to show the first interest in forestry by establishing a course of lectures in botany and later in forest economy, to which was added a practical course at Tegel under Burgsdorf. This, however, did not last very long; and with the death of Burgsdorf in 1802 the school was discontinued. The teaching of forestry was transferred from the University of Berlin to Eberswalde, where in 1830 the present Eberswalde Forest Academy was established. A little later there was formed a forest department at the University of Giessen, and forest education was taken up also by the universities of Tübingen and Munich (1789).

Germany possesses at present three professional forest institutions of the highest grade, namely, at Eberswalde, near Berlin ; Münden, near Cassel ; and Tharandt, near Dresden; and besides these, forest departments at the universities of Tübingen, Giessen, and Munich, and at the Polytechnicum at Karlsruhe. There are two distinct types of forest schools in Germany : first, those which are devoted exclusively to the study of forest science and

Forest Rangers at School in the Woods. (Manitou Park, Colorado.)

Forest Measurement. (Buena, Texas.)

Yale Forestry School at Work in Summer Quarters. (Milford, Pennsylvania.)

Foresters taking a Tree Analysis. (Calhoun Co., Arkansas.)

FORESTRY EDUCATION.

its collateral branches, the so-called "forest academies"; second, the university, *allgemeine Hochschule*, a college, or polytechnic institution, with a comprehensive course of study, of which forestry is one of the prominent departments. There are a number of advocates who favor locating forest schools entirely by themselves, and object to the universities for the reasons that they are designed to aid investigations in the abstract rather than in the concrete; that since they are located far away from any forest, the professors are less acquainted with practical forestry, and the students, though more versatile, fail to learn thoroughly the things most essential for their profession, remain strangers to the forest, and do not learn how to question trees. They further believe that in order to be a means of instruction the forest must be a demonstration ground, and should be so situated that it can be visited daily without difficulty or expense; that the university is more a center of general culture, a feature of secondary importance in forest technology; that the university professors of such sciences as botany, chemistry, zoölogy, and geology are out of sympathy with the forester, and are not willing to adapt the courses to the needs of the forest students; that, while universities are rich fountains of knowledge, they do not specialize enough. They hold, on the other hand, that the forest academies keep the practical always in view, and the attainment of knowledge is always combined with experience.

Those favoring the attachment of forest schools to universities point out that liberal education is just as essential in forest training as in any other profession; that most of the universities are surrounded by woods which are suited as means of instruction, and that it is not the extent of a forest which decides its advantage as a demonstration ground, but its variety of trees and modes of treatment and utilization; that the situation of universities near railroads gives them the best facilities for excursions and for full demonstration in the field; and that scientific research and practical work are not antagonistic to each other. These advantages are clearly shown by the fact that universities have produced more eminent writers and thinkers in the field of forestry than "forest academies." These differing views as to the best place for teaching forestry have not yet been reconciled in Germany, and the whole matter is an open question in the United States.

All the schools of higher education in Germany are state institutions, and the applicant for entrance to them must be a graduate either of a classical or real-gymnasium, and before entering the forest school must have spent a short period, from one-half to one year, in the woods, to familiarize himself, under the guidance of a forest officer, with the general features of the business he proposes to engage in, and in this way test his fitness for it. After this experience in the woods, he enters the forest academy, or the forest department of a university, for two and one-half or three years. Upon completion of his course at the forest academy or university, he does not enter at once the government forest service, but must, at his own expense, spend at least two years in studying cultural operations in various districts, during which time he may be temporarily employed at small wages in some scientific or administrative work. He must keep a full diary of his doings and observations, which must be certified to by the district forest manager with whom he stays, and which form a part of his official examination. For nine months during this time he must constantly perform all the duties of a forest ranger in a certain district, and occasionally also certain functions of a forest manager. After these two years of practical work in the woods, he again enters the university for one or two years to study law, unless he has already done so; and only then can he present himself for the final examination for the position of a forester entitled to have charge of a forest district. His examination lasts from eight to ten days, and is based not only on written and oral examinations, but also on the diary kept during his practical work. Thus the training of the forester in Germany takes from six to seven years.

The curriculum of the Tharandt Academy may be cited as an example of the instruction given at the German forest academies. The course covers three years, and includes the following subjects: I. *Pure mathematics and natural sciences.* (*a*) Differential or integral calculus. (*b*) Experimental physics. Mechanics. (*c*) Meteorology. (*d*) Inorganic experimental chemistry. Organic chemistry. Practical course in chemistry. (*e*) Mineralogy and petrography. Geology. Practical course in mineralogy and petrography. (*f*) General botany: (1). Morphology. Taxonomy. (2). Anatomy. Physiology. Practical course in botany. (*g*) General zoölogy. Practical course in zoölogy. II. Forestry. *Applied mathematics and natural science.* (*a*) General course in forest sciences. (*b*) Forest botany. Practical course in forest botany. Plant physiology. (*c*) Forest zoölogy: (1). Vertebrates. (2). Insects. (*d*) Forest protection. (*e*) A course in forest soils and forest sites. (*f*) Silviculture. (*g*) Forest utilization. (*h*) Chemical forest technology. Practical course in chemical forest technology. (*i*) Course in the construction of forest roads. (*k*) Land surveying. Preparation of forest maps. (*l*) Forest mensuration. Forest valuation. Forest finance. (*m*) Forest organization. Practical course in forest mensuration. (*n*) Forest administration. (*o*) Forest policy. (*p*) History of forestry. III. *Auxiliary sciences.* (*a*) Political economy. (*b*) Law.

(*c*) Agriculture. (*d*) Hunting. (*e*) Game and fish culture. (*f*) Hygiene. Excursions.

In addition to the forest academics and forest departments in universities, there are also several secondary forest academies, such as those at Eisenach, in Saxony, and Aschaffenburg, in Bavaria, and elementary forest schools for the training of rangers and subordinate forest officers who are directly charged with the carrying out of all forest work.

Thus Germany, with a forest area of about 35,000,000 acres, has nine forest schools, not counting the elementary schools for the training of the technical forest force. The efficiency of forest administration and management of the German forests, which form one of the chief sources of revenue to the states, is directly traceable to the maintenance of a high standard of forest education for those who are charged with the direction of the work.

France. — The real beginning of forest education was made in 1825, with the establishment at Nancy of a national forest school (*Ecole Nationale Forestière de Nancy*). Before the establishment of this school the government forests were in charge of untrained men. The offices of foresters were given to courtiers as benefices, and became hereditary, no professional knowledge being required. On the whole, the situation was very similar to that which existed in Germany about the middle of the eighteenth century; but in France, on account of the political turmoil during the First Empire, no attention was given to the proper training of foresters, and the scientific management of the forests was not taken up until a somewhat later time than in Germany. The first director of the Nancy forest school was Bernard Lorentz, who received his education in Germany. The early history of the national forest school was influenced by the teachings of German foresters. The school had a hard struggle for recognition, and did not begin to attain the high standing which it now occupies until 1877, when the government forests and the forest school were transferred from the jurisdiction of the Secretary of the Treasury to the Department of Agriculture. With the transfer of the school to the Department of Agriculture it was entirely reorganized, and at present the French national forest school is one of the highest seats of learning, and is equal to the best forest schools of Germany. Only those who graduate from the Agronomic Institute, of Paris, and in exceptional cases also those who complete a full course in the Polytechnicum, are admitted as students to the forest school. The number of students who are allowed to enter every year does not exceed twelve. They cannot be older than twenty-two years, must have no physical defects, and must be fitted for army life. The course covers two years. The students are required to do three years' service in the army, but the two years of academic life are counted as two years on the term of their military service. Those who graduate from the school enter the military service as officers of subordinate rank, while those who fail must complete their military service in the rank and file. The students live in the school, and must submit to what is practically a military régime. The curriculum is very similar to that of the German schools, except that considerable stress is laid on horseback riding, fencing, gymnastics, shooting, and drill. Since, as a rule, among those who graduate from the Agronomic Institute of Paris there are more than twelve persons who are willing to enter the forest school, the applicants must pass a competitive examination in mathematics and German. In connection with the forest school there is a forest experiment station which serves as a demonstration ground for practical work in forestry. Graduates from this school enter at once the government service, not as independent forest managers, but, at first, at least for a year, under the guidance of an older forest inspector. The Nancy school, being a graduate school, and its students being chosen from the élite of the graduates of that institute, has produced a type of foresters who are highly educated men, many of whom have attained European fame and brought the practice of forestry in France to a high state of development.

Besides the school at Nancy there is also a secondary school at Barres, which aims chiefly to train young men for the subordinate positions in forest administration. One feature, however, of the school is that its graduates may eventually attain the same high position in forest administration as graduates from the school at Nancy. The entrance is through competitive examination. From among those who successfully pass the examination are selected about twenty or twenty-two young men. Those who are admitted to the school are appointed assistant forest guards (*garde auxiliaire*) in the regular forest service, and remain in this capacity until they finish school, a period of two years. After they graduate from the school and have reached the age of twenty-five years, they are appointed as forest guards, and two years later they are promoted to the grade of " brigadier," corresponding to forest ranger in the United States. After studying one more year in the school, and successfully completing the course there, they are eligible to the positions, at first of assistant forest managers, and later of forest managers. Thus the school at Barres offers the same openings as the school at Nancy, though there is a difference in the method of training. While the school at Nancy lays considerable stress on the theoretical education of the students, the school at Barres promotes principally the practical training.

Austria-Hungary. — Just as in Germany and France, the training of forest students was begun in this country at first by private enterprise. The two largest forest owners in Austria, the Princes Lichtenstein of Bohemia and Schwarzenberg of Moravia established the first forest schools in 1800. In 1805 the state institute near Vienna and another private school in Bohemia came into existence. The state institute was transferred in 1813 to Mariabrunn, and after many modifications in the character of the teaching was changed, in 1867, to an academy with a three years' course. In 1875 it was combined with the agricultural college in Vienna (*Hochschule für Bodenkultur*), opened in 1872, and at present it is the only forest school in Austria which gives a thoroughly scientific forest education. It has a three-year course, and employs seventy-one professors and instructors. During the years from 1875 to 1904, 2600 forest students were in attendance. The curriculum at the Agricultural College at Vienna is the same as in the best German forest schools. In addition to this forest school, there are in Austria several other so-called " middle schools," and about seven lower schools for the education of guards. In this respect Austria occupies a distinct place among the different countries in the excellent organization of these schools for the education of the subordinate technical forest personnel.

Russia. —The attempt at forest education in Russia dates back to 1730, when a number of foresters were secured from Germany to take charge of the management of the government forests. They were also intrusted with the education of foresters, each *Forstmeister* having six pupils assigned to him. This arrangement, however, did not prove satisfactory, and since it was feared that a timber shortage might cripple the navy, a course in forestry was instituted in 1800 at the Naval Academy. This was followed by several other schools, one at Zarskoye Selo (near St. Petersburg) in 1803, another at Kozlovsk, in 1805, and a third at St. Petersburg, in 1808. Of all these there remains now only the Forest Institute at St. Petersburg, which has lived through many vicissitudes, and reflects in its organization, character, and scope of teaching all the changes in the forest policy of Russia. In this case, in particular, it may be said that the history of the St. Petersburg Forest Institute is practically the history of forestry in Russia. This forest institute provides a four-year course, has fifteen professors and instructors, and prepares young men for the higher positions in the Russian forest service. In 1860 another high-grade forest school was created at Novo-Alexandria, near Warsaw, known as the Novo-Alexandriysk Institute of Agriculture and Forestry. It also has a four-year course, and has the same object and scope as the St. Petersburg Forest Institute.

In addition to these two independent forest schools, chairs of forestry exist at Petrovsk Rural Academy in Moscow, and in the Riga Polytechnic Institute, and also in seven secondary schools of rural economy. Russia leads particularly in the training of forest rangers and guards. These schools, of which there are now thirty, are established after the Austrian pattern. The course of study is two years, and consists mainly of practical work, supplemented by a theoretical study of silviculture. In addition, foresters in charge of a district are allowed to train men and have them pass the final examination at these lower schools. The higher education for forestry in Russia resembles very closely that of Germany in the curriculum of its schools and in the high standard of entrance requirements. Only two high-grade forest schools, however, for an area of about 810,000,000 acres of forest land provides, of course, a comparatively small number of technically trained foresters, as contrasted with the seven forest schools in Germany for a forest area of only 35,000,000 acres.

Finland. — In Finland a school of forestry was established in 1863 at Evois, but instruction here was occasionally suspended because of an insufficient number of pupils. Recently the school has been extended ; and in addition a course of instruction in forestry at Helsingfors is being contemplated. Schools of instruction for forest guards are also provided.

Italy. — A high-grade forest school is located at Vallombrosa, situated in the Appenines at an elevation of 900 meters. The forest institute is under the direction of the Department of Agriculture. The institute was created in 1869. The course of study is four years, beginning March 1 and ending Nov. 1. From 1869 to 1903, 300 students have been graduated from this institute. The number of students that can be admitted to the institute is determined each year by the Department of Agriculture, and as a rule it is very limited. Thus, in 1903, there were in all thirty-four students. Only graduates from technical schools or lyceums (*licenza leceale*) are admitted. Since the number of applicants is always greater than the number approved by the Department, only those who have graduated with the highest rank are admitted to the institute. Graduates are appointed as assistant foresters (*Sotto-ispettore aggunto*), or temporarily as forest rangers (*Brigadier forestale*). The organization of the institute is military. The courses are thorough, and much stress is laid on the basic natural sciences.

Sweden. — Forestry is provided for in a State Forest Institute at Stockholm, and two secondary schools, one at Omberg, founded in 1886, and another at Kloben (1900), where a one-year course is given, mainly in practical work preparatory to entrance into the State Forest Institute. The number of students in the institute is limited to twenty-two, and the term lasts two and one-half years.

The school has, besides its director, six professors; in addition to the training of forest officers for higher positions in the forest service, it provides also a less intensive course for the men of the lower technical grades. The government is very liberal in its support of its forest institute, and tuition is free. The graduates from the schools are at once appointed to the regular forest service, and in ten years may attain the position of *jagmastare*. There are seven schools for the training of the subordinate officers, located in forests in different parts of the country, and each with one teacher and one or more assistants. Not only is the tuition free, but a number of the students receive also board and lodging throughout the course, which lasts one year.

Norway. — The first foresters in Norway received their education in other countries, at Tharandt Academy, Eberswalde, and also at Stockholm. In 1897 there was established a forest department in the Norwegian Agricultural College at Christiania. Between 1901 and 1907 sixty-two students were graduated from that school. Students are admitted every other year. The course extends over three years. Besides the forest department at the Agricultural College at Christiania, there are also three schools where elementary instruction is given. One of the schools was founded in 1875 at Kongsberg, another in 1880 at Stenkjaer, and still another in 1884 at Elverum. The term of study is nine months, and only twelve pupils, between the ages of eighteen and thirty years, are admitted every year. The course is both theoretical and practical. In addition to these three schools, courses in forestry are also given at two lower agricultural schools, namely, at the Jonsberg Institute (1897) and at Hove (1907).

England. — England's need for technically trained foresters first became pressing when the necessity arose for placing the large forests of British India under scientific management. Having no foresters of its own, the government, in 1866, intrusted the organization of the forest service in British India to a German forester, Dietrich Brandis. For the first few years the officers of the Indian forest service were appointed without any special training, the personnel being recruited from the Indian army, and by the appointment of those seemingly qualified for the rough, adventurous life in the jungle, and fond of camp life and sport. It very soon became apparent, however, that if the forests of British India were to be well organized and managed, it was absolutely necessary to insure a regular supply of young foresters who had a thorough training. In 1866 the government had appointed as assistants to Brandis two young German foresters, and in that same year the first competitive examination was held in London for "probationers," who were to be trained, some in Germany and others in France, for two and one-half years before entering the regular forest service. Such training of prospective foresters for the Indian forest service lasted until 1875 in Germany, and until 1886 in France. In 1885, however, the English government determined to take over the education of its own forest officers, and established a course of forestry at the Imperial College of Engineering at Cooper's Hill in Surrey. In 1905 the training of the foresters was transferred to Oxford University. The course covers a period of three years, of which one year is spent on the Continent. While this course is primarily intended for "probationers" for service in the Indian Forest Department, other members of the university may attend the instruction in forestry. In addition to the training of forest officers for the higher positions in the Indian service, there was felt the need of giving the natives of India who occupied subordinate positions in the service some technical education in forestry. This was finally provided for in 1878 by establishing the Indian Forest School at Dehra Dun, which in 1884 was changed into an Imperial Institute. At this school the course, which extends over a period of two years, is given both in English and in the vernacular, and from among the graduates of this school the subordinate force is recruited.

For the training of foresters for home service, there has existed since 1895 at the University of Edinburgh a course in forestry which was started by private subscription. This course extends over three academic years, of which two and one-third are spent at the university, and leads to the degree of Bachelor of Science in Forestry. During the fourteen years, from 1895 to 1909, fifty-one students have been graduated from the forest department.

A Departmental Committee appointed by the Board of Agriculture and Fisheries in 1902 to inquire into and report upon British forestry presented a unanimous report, in which it urged "the immediate and effective provision for bringing systematized instruction in forestry within reach of owners, foresters, and woodsmen." As a result of this recommendation Great Britain has considerably increased the facilities for instruction in forestry within the last eight years. While before the inquiry by the Departmental Committee there were no organized courses of instruction in forestry other than those given at the Engineering College at Cooper's Hill and the University of Edinburgh, there are now ten centers where forestry is taught, namely, the University of Oxford; the Forest of Dean, where a school of forestry has been established by the Commissioners of His Majesty's Woods and Forests; University College of North Wales, Bangor; Armstrong College, Newcastle-upon-Tyne; University of Cambridge; the Royal Agricultural College, Cirencester; Glasgow and

A Valuation Crew at Work in the Adirondack Mountains.

Planting Trees in a National Forest Reserve. (Nebraska.)

Summer Camp of the Yale Forestry School at Milford, Pennsylvania.

FORESTRY EDUCATION.

West of Scotland Agricultural College; Edinburgh and East of Scotland College of Agriculture; and Aberdeen and North of Scotland College of Agriculture. In addition, mention should be made of the Inverliever Estate in Argyllshire, which has been purchased by the Commissioners of His Majesty's Woods and Forests for the purpose of carrying out an experiment in afforestation on scientific and economic lines, and the Alice Holt Woods, which are now being worked as a demonstration area for the practical study of forestry.

Canada. — In 1907 the Ontario government established in its provincial university at Toronto a fully equipped faculty of forestry. The entrance requirements to the department of forestry are made higher than for any other department in the university, namely, honor matriculation in English and mathematics. The University of Toronto offers a four-year course, leading to the degree of Bachelor of Science in Forestry, B.Sc.F., and after three years' work in practice, to the degree of Forest Engineer, F.E. In addition to the four-year course, a six-year course is provided, which includes humanities and greater specialization in sciences, and entitles the graduates from the forestry department also to the degree of Master of Arts. The latter course is intended to produce professional men with a broad liberal education, leaders of the highest type. In 1908 the Province of New Brunswick established a chair of forestry in its university, and during the summer of 1910 another forest school attempting high-grade education was started in the Province of Quebec, under the auspices of the Crown Lands Department of the province, and affiliated with Laval University. Admission is based on a competitive examination. Ten scholarships are provided to make entrance attractive, and there is, in addition, a promise of employment by the government. In addition to these forest departments in connection with universities, farm forestry is taught at the Guelph Agricultural College.

Other Countries. — In Denmark the officials in the higher technical grades are trained at the Royal Veterinary and Agricultural College at Copenhagen, which was established in 1869. The course lasts five years, including one and one-half years of practical work. Tuition is free. In Switzerland the forest school is connected with the Polytechnicum at Zürich. In Spain there exists a high-grade school of forestry, *Escuela Especial de Ingenieros de Montes*, from which the Spanish corps of engineers is recruited. This school was instituted in 1835, and is now located in one of the buildings of the Palace of the Escuriel, near Madrid. It has a four-year course, and the preparation is fully equal to any of the German or French schools. In Japan forestry is taught at the University of Tokio. In South Africa there is a forest school at Cape Town, established by the Government of Cape Colony, for the scientific training of forest officers and for research in South African forestry. The regular course covers a period of two years, preceded by a preliminary scientific course of one year.

United States. — The progress of forest education in the United States has been very rapid. While in 1897, with the exception of lectures on dendrology and forest geography as a part of the botanical courses given in a number of land-grant colleges, there were no professional forest schools, to-day there are about twenty distinct forest schools or forest departments, and twenty-five agricultural colleges, polytechnic institutes, or universities give one or more courses in forestry. Moreover, a number of secondary schools include forestry in their curricula. This marvelous growth has been due to the awakening of public opinion, as the need of the proper care and handling of the remaining timberlands became apparent. This movement was brought to a focus chiefly by the activities of the United States Forest Service. In this rapid growth lies both the strength and weakness of forestry education in this country. The strength is shown by the rapidity with which various universities have taken up forestry, since that is a demonstration that forestry is now recognized as a profession, and that there is a place for the professional forest school. Its weakness lies in the danger of overcrowding the profession with poorly trained men, before the science is fully developed.

The progress of forest education in this country has been radically different from that in Europe. In Europe the practice of forestry anteceded the theoretical development of, and education in, forest sciences. In Germany forest practice existed for a century or more before the first forest school was established in 1764. In this country rapid economic development made heavy inroads upon forest resources, — clearing the forest for farm purposes, and the lack of forest protection have created a sudden demand for technically trained foresters, and thus academic training started before forestry was practiced in the woods. For this reason the teaching of forestry in this country is under a handicap, because there is a lack of illustrations of what can be accomplished by the practical application of forest science. The work of the forester in America, therefore, is that of a pioneer who must first lay the foundation upon which the entire structure of future forestry in this country will rest, and the most thorough forest education becomes for this reason essential.

The first professional forest school was established in 1898 at Cornell University, and almost simultaneously with it a private school at Biltmore was opened by Dr. C. A. Schenck. In 1899 the Pinchot family endowed a forest school at Yale University, and in 1903 the

University of Michigan opened a professional department of forestry. This marked the beginning of the era of professional forest schools in this country, which subsequently spread, through the establishment of courses at one after another of the agricultural colleges and universities throughout the country. There are to-day probably from four to five hundred men engaged in work requiring a knowledge of technical forestry, who are mostly graduated from these schools. It was inevitable that in the rapid multiplication of forest schools in this country, started at different educational institutions, there should be a lack of a uniform standard in the equipment, methods, and character of teaching, even of schools which apparently have the same object in view, namely, the training of the higher technical foresters.

The professional forest schools in this country may be divided into four groups: (1) Graduate schools. These offer college graduates a grade of professional training to fit the students for the highest administrative positions in the profession. They usually give a two-year course leading to the degree of Master of Forestry, and require for admission a college training, with the bachelor degree from an institution of standing. (2) Undergraduate schools, organized on coördinate lines with the other departments of the university. Their curriculum covers four years, and some of them provide also for postgraduate work. (3) Ranger schools, devoted principally to the training of young men for the position of forest ranger and woods superintendent. (4) Courses in forestry. A large number of colleges and universities give one or more courses in forestry, which are intended, not for training professional foresters, but merely as a part of general education, and particularly of agricultural education, or as preparatory to the study of forestry at some professional forest school.

An attempt to set a standard of forest education which will result in standardizing the profession in this country has already been made at a conference of forest schools which was held in Washington at the close of 1909, in which fifteen universities and colleges giving instruction in forestry participated. A committee of five was appointed to consider and report to the conference a scheme for establishing a minimum standard curriculum in forestry. Such standardization of forest education in this country is absolutely indispensable, since the training of foresters is not, as it is abroad, in the hands of the government, but in the hands of universities and colleges, in the majority of cases privately endowed. In the case of graduates entering the Forest Service, the necessary civil service examination acts, in a measure, as a standard for forest education in this country, but such an examination cannot be a true test of thoroughness of preparation, and besides, there are other fields for forest activities outside of the government service, where a thorough training is absolutely essential for carrying on the work expected from the new profession.

While the education of the higher grade of foresters is amply provided for in the United States, there are hardly any schools intended primarily for the training of forest rangers or woods superintendents. Undergraduate schools of forestry have short winter or summer courses specially intended for the training of forest rangers. There is one school, the Pennsylvania State Forest Academy at Mont Alto, Pa., which aims principally to prepare young men for the position of forest rangers in the state forest service, and comes closer in its organization and character of education to similar schools in Europe. It is a three-year course, and the vacancies are filled by appointment after a competitive examination. The graduates must remain in the state service at least three years after graduation.

In a class by itself because of its organization, methods, and purposes is the Biltmore Forest School, which is a type of the *Forstmeister* school which was common in the early history of forest education in Germany. It has a one-year course, supplemented by six months of practical work. In that school theoretical education in the fundamental sciences occupies a secondary place, and main stress is laid upon familiarizing the student with the practical problems of the woods.

Unlike England, the United States does not train young men especially for the forest service in the Philippines, but the Philippine corps of foresters is recruited from among the graduates of the forest schools in the states. Similar, however, to the Dehra Dun school in British India, a course in forestry is now given at the College of Agriculture in Los Banos, La Laguna Province, for the training of the Filipinos. The course is so arranged that boys who have completed the seventh grade can enter and graduate in four years. The first two years' work is identical with the work of the agricultural college students, including courses in English, mathematics, botany, zoölogy and entomology. The last two years are devoted to forestry. The school is similar to some of our undergraduate forest schools, and aims to train men for the higher technical positions in the Philippine service.

Below is given a complete list of forest schools arranged according to the character of the course given in them: —

Graduate Schools. — Yale University, New Haven, Conn.; Yale Forest School (founded in 1900). University of Michigan, Ann Arbor; Course of Forestry (founded in 1901). Harvard University, Cambridge, Mass.; Division of Forestry, School of Applied Science.

Undergraduate Schools. — University of Minnesota, Minneapolis; College of Forestry. University of Washington, Seattle; School of Forestry (established 1907). Colorado College, Colorado Springs; School of Forestry (established 1905). Colorado Agricultural College, Fort Collins. University of Georgia, Athens, College of Agriculture; School of Forestry. University of Idaho, Moscow. Purdue University, Lafayette, Ind. Iowa State College, Ames. University of Maine, Orono. Michigan Agricultural College, East Lansing; Forestry course (established 1902). University of Montana, Missoula. University of Nebraska, Lincoln; College of Agriculture. Oregon Agricultural College, Corvallis. Pennsylvania State College, State College, Pa. State College of Washington, Pullman. Biltmore Forest School, which holds a winter session in Germany, a spring session in the Adirondacks and Southern Appalachians, and during the autumn months in the Lake States. Pennsylvania State Forest Academy, Mont Alto.

Ranger Schools. — A number of undergraduate schools of forestry have a short winter or summer course especially intended for the training of forest rangers. Several undergraduate schools, while not intended primarily for training rangers, give courses not much above the requirements of a ranger.

Courses in Forestry. — Alabama Polytechnic Institute, Auburn; Connecticut Agricultural College, Newark; Delaware College, Newark; Kansas State Agricultural College, Manhattan; University of Illinois, Urbana; Berea College, Berea, Ky.; Maryland Agricultural College, College Park; Massachusetts Agricultural College, Amherst; Mississippi Agricultural and Mechanical College, Agricultural College; University of Missouri, Columbia; University of Nevada, Reno; New Hampshire College, Durham; North Dakota Agricultural College, Fargo; Oklahoma Agricultural and Mechanical College, Stillwater; Rhode Island State College, Kingston; Clemson Agricultural College, Clemson, S.C.; South Dakota State College of Agriculture and Mechanic Arts, Brookings; University of Tennessee, Knoxville; Agricultural College of Utah, Logan; University of Vermont, Burlington; Middlebury College, Middlebury, Vt.; Hampton Normal and Agricultural Institute, Hampton, Va.; West Virginia University, Morgantown; University of Wisconsin, Madison.

Courses in Secondary Schools. — Eric Forest School, Duxbury, Mass.; Mount Hermon School, Mount Hermon, Mass.; Smith's Agricultural School, Northampton, Mass.; Crookston School of Agriculture, Crookston, Minn.; North Dakota School of Forestry, Bottineau; Murray State School of Agriculture, Tishomingo, Oklahoma. H. S. G. and R. Z.

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FORGETFULNESS. — This term may be either the normal negative of retention, or it may become abnormal. Abnormal forgetfulness, or amnesia (*q.v.*), grades into the types of forgetfulness that occur in ordinary fatigue (*q.v.*) and ordinary lapses (*q.v.*). C. H. J.

See Memory.

FORM. — The term used in English secondary schools for class or subdivision of the school. It was introduced early in the sixteenth century, and is frequently found in the statutes of that century. Six forms were found almost universally in all schools, and this number has remained as the framework of school organization up to the present time. The highest form is always called the *Sixth.* With the increase of pupils and the growth of the schools, further subdivisions became necessary, and upper, lower, and middle forms were introduced, *e.g.* Lower Fourth, Upper Fourth, etc., and further, without changing the general scheme, forms with new names have been interposed between the old forms, *e.g.* some schools have a Remove, between the fourth and fifth, a Shell between the third and fourth, and some form between the fifth and sixth. Beyond the six forms, however, there is no uniformity in grouping or names.

See Grammar Schools, English; Public Schools.

FORM. — See Musical Terms.

FORM AND CONTENT. — As already noted (see Content Subjects), there exists a division of studies into form studies (*e.g.* writing as penmanship, spelling, formal grammar, numerical calculations) and content studies, such as literary composition, history, literature, nature study, etc. The division has practical convenience, but from the standpoint of educational principles brings to light a serious dualism and an important problem. In principle both form and content lose when separated from each other; the value of correlation (*q.v.*), as a practical device, consists largely in overcoming or counteracting their divorce. That the *merely* formal tends to be barren and mechanical needs no argument. Conversely, content, without form, tends to be miscellaneous, unorganized, and, consequently, ineffective. The problem thus brought to attention is whether there exists an inherent connection between form and content, and if so, what is the genuine meaning of each from the standpoint of their organic relation to one another.

The discussion of experience (*q.v.*) indicates that experience has a double aspect; it always involves subject matter, or is an experience *of* something, and it involves definite tendencies toward change of subject matter, or exhibits a transition. Since different subject matters (whether facts, ideas, or acts) have very different values, the control of the process of change becomes a matter of fundamental importance. It is necessary that experience should not proceed (or change) at haphazard, but that it should maintain its subject matter at a certain level of value, and that there should be growth, progress to the richer and more significant, not retrogression into the trivial and superficial. The more static aspect of experience (its subject matter taken in cross section) may be called its *what*, or content; its dynamic or lengthwise aspect may then be called its *how*, or method of change. When this manner of change is distinguished with reference to the control of matters of further experience, we have the *form* side.

This abstract formulation may be made more definite by calling attention to the fact that the symbols with which reading, writing, arithmetical and algebraic operations, the general laws of science, etc., are concerned, are the instrumentalities by which the ongoing course of human experience is directed. Any method or tool consciously used for some end may be regarded as *form*, while the subject matter which is obtained and improved through its use is *content*. The problem, then, of the proper relation of form and content in education is the problem of dealing with a subject matter of a valuable experience in such a way that a hold upon this class of subject matter will be secured and improved; in other words, so that a method of control of this type of subject matter will grow up. Content must come first, but the contact with content — the way of experiencing it — is defective unless it results in a gain of power to obtain and manage that sort of content when needed.

Even a slight inspection shows that forms, or methods of control, are of two sorts, one more natural, the other more conventional. The formulæ of mathematics, the laws of the natural sciences, the fundamental logical and psychological relations of speech, are of the former sort. The notational system used in mathematics, forms of oral and written address, rules of punctuation, changes in the inflection of words, modes of etiquette, and much of what is termed "polite manners," are of the latter type. With respect to this distinction, it is (1) requisite that pupils should become aware of what is more natural and fixed in distinction from forms that are more arbitrary and variable, while it is also (2) necessary that they should realize that, though the use of this rather than that form may be conventional, some conventional arrangement is absolutely necessary. In other words, the existence of conventions is not conventional, but necessary. For example, whether a person speaks the English or the French language originally will be more or less arbitrary; but to be able to speak some language is an indispensable condition of social intercourse and of intellectual power, with all that these two things imply for the guidance and enrichment of experience. The same principle holds as to manners; it is more or less arbitrary that respect is shown by tipping the hat, but the existence of some sign of respect and regard for others is a social necessity.

It will be found that educational errors in practice, with respect to the relation of content and form, tend to group themselves between two poles. Either forms are treated as ends in themselves, not as methods of securing and enriching content; or, in reaction against this exaggeration, they are treated as of slight or negligible importance. We may paraphrase what Kant said of a somewhat similar matter: Form without content is empty; content without form is blind. And this applies educationally to the relation of the phases of subjects which are concerned with mastery of symbols and technique to those phases which consist of subject matter inherently significant.

J. D.

FORM STUDY. — A special term to designate instruction in space relations. It has long been assumed in the work of elementary instruction that space perception required no special training. Any analysis of space perception (*q.v.*) makes it clear that the ability to recognize space relations is the product of mental development. This is illustrated in a practical educational way by the fact that the interpretation of the solid figures used in the study of geometry cannot be attained by the pupil without some special study of the figures involved. A clear recognition of the form of objects studied in nature study is another illustration of the same type. Form study is one of the explicit aims of instruction in drawing. A gradual realization of the importance of form study appears in the growing tendency to introduce constructive geometry into the lower grades. C. H. J.

See ART IN EDUCATION; ART IN THE SCHOOLS; DESIGN; DRAWING.

FORMAL AIMS. — COURSE OF STUDY, THEORY OF; END IN EDUCATION; VALUES, EDUCATIONAL.

FORMAL DISCIPLINE. — This expression has been used to indicate the general reaction upon the abilities of a student that is by many supposed to spring from the method of their study rather than from the content which is learned. We may distinguish, in the first place, between the information and the discipline that we may derive from a subject; and again between the specific discipline, or increased power of dealing with similar material, and the general discipline or increased ability to deal with any sort of material, the treatment of which involves somewhat the same general powers of the mind. Although formal discipline, a discipline derived from the form of the study rather than from its content, may be said to include both specific and general results, it is in connection with the latter especially that educational controversy has arisen.

The idea of a general mental discipline to be derived from the form of specific studies becomes especially prominent at times in the history of education when a well-established curriculum begins to have less content value than it had at the time of its foundation. Under these circumstances the schoolmasters who advocate the studies that are becoming a trifle antiquated naturally reply to the attack of practical men who question the usefulness of their teaching by saying that, although the information they give is of little practical value, the discipline that their subjects affords increases the general ability of their students to deal with any sort of material. The students learn to observe, to analyze, compare, and classify, to imagine and remember, to reason and judge, to will, even to create. They acquire habits of punctuality, of attention, of regularity, of application to work. All these accomplishments are useful, no matter what one tries to do. It is far more useful, the disciplinary argument runs, to possess such general training than merely to have in mind certain specific facts, which must of necessity have a very limited application.

The disciplinary argument has been used, not only to defend the classics or mathematics, but newer subjects as well, such as laboratory science for all. It has been employed to defend prescription, because, even though the content of the prescribed subjects may not be worth while for all, yet their disciplinary effects are conceived to be universally valuable. It has also been employed to defend election, on the ground that it does not matter what one studies, since after all the important thing is how the study is carried on. It is evident, therefore, that the argument from formal discipline has done very little to settle what should be studied. It has instead clouded the issue and prevented a decisive conclusion.

On the other hand, it is clear that, if there are general disciplinary effects, these are relatively of such great importance as to outweigh all others. The telling differences between men and brutes, between men of different races, and between men of the same race turn largely on what may be called intellectual power. Now if any sort of training can be said to improve this general power to think, such culture possesses the unusual merit of not simply differentiating its possessor from others less fortunate, but also of elevating him above them. Some facts lead naturally to the assumption that general intellectual power can be increased by education. The most striking is the general mental superiority of the educated class. Although there are marked exceptions, it is unquestionably true that the men who have been well trained according to the educational standards of a period show, on the average, greater intellectual grasp in handling its problems. This fact may, however, be very easily explained by the simple supposition that those who take and succeed in mastering this culture are in the beginning possessed of better minds than the average. Thus their later efficiency may be due not to their training, but to their native ability, of the possession of which the getting of an education is only one among many proofs. For example, although college men may, as compared with others, average greater distinction in life, yet this may not be due to their education, but to the mental ability which enabled them to comply with the severe requirements of the course of study. Thus, when we criticize the foundation of the natural tendency to trace the superiority of the educated to their education, we find that, after we subtract the special advantages of prestige and of specific knowledge and discipline, the margin of general superiority that is left to them seems capable of being accounted for by their initial advantage rather than as a product of their culture.

Undoubtedly the strongest support that the idea of formal discipline has received in the past has come from the practically universal belief in certain abstract mental powers or faculties. The psychologist, in analyzing the processes of the mind, naturally classifies them. Many make the grand divisions of knowing, feeling, and willing. All distinguish between perception, memory, and imagination, reasoning, judgment, will, and the emotions. Now at the very outset of this analysis the psychologist encounters a fact which naturally leads to the theory that these are distinct faculties. He finds that there are many kinds of sensation, and that the impression that any given object makes upon us depends upon which sense it affects. The same object impresses us very differently when we look at it and when we touch it. The qualities of sensation spring from the nature of the sense organs quite as much as from the qualities of the object. The excellence in seeing depends not so much upon what is to be seen, but rather on the eye that sees. And just as the power of sensation is dependent upon the sense organ, so the powers of perception, of memory, of reasoning, etc., are naturally supposed to depend upon the inner organs through the activities of which these forms of consciousness are made possible.

The belief in these various faculties does not of necessity carry with it the conception that they may be generally improved by exercise in specific directions. However, when emphasis is placed on the form of the activity, and when it is assumed that all activities of a certain form depend upon a special inner power that exerts itself equally in connection with whatsoever material, any observed increase in its efficiency in dealing with this or that content will be naturally expected to appear when attention is directed to other content. The older view that mental activity is such an abstract energy functioning independently of the character of the material presented was modified essentially by the Kantian and especially by the Herbartian theory of apperception. (See APPERCEPTION.) According to Herbart, we should think of the process of apperception as the assimilation of new ideas by ideas that have already been apperceived, or incorporated into the living content of the mind. He rejected explicitly the faculty theory, regarding it as valid merely as a description of various phases in the process of assimilation or apperception. Thus we are led to think of the mind, not as made up of perceptive, imaginative, rational and volitional powers, but rather of groups of ideas, each of which determine for us a specific power of perceiving, remembering, judging, or desiring ideas of a similar character.

Modern psychology has done much to justify the Herbartian conception of the mind. It has been found that memory is a somewhat specialized power. Certain persons have a better memory for visual experience, others for auditory experience, etc. Moreover, it is recognized that one's powers of discrimination are a function of what he knows. The microscopist may see with his glass significant structures that to the untrained eye are practically invisible, since the attention cannot single them out. The same expert might show a lamentable lack of ability to note the essential features in the style of dress worn by a woman. We see what we expect to see. So, too, one's memory is so largely dependent upon association that his ability will lie especially in those fields in which he already possesses a rich fund of material with which to associate the new fact. In a sense, one's experience, what he has assimilated and therefore remembers and knows, determines what he shall see and remember, and how he shall judge and will.

Thus the Herbartian " content " theory of mind has, at least in the main, constituted the point of view of modern psychology. Ideas, or at any rate the physiological processes with which specific ideas are associated, are conceived to be the forces in mental activity. Now, while the acceptance of the faculty theory, as was said, does not necessarily involve the acceptance of the idea that there is a general effect from specific training, its rejection does go far toward discrediting such an effect, at least as maintained by the extreme disciplinarians. Herbart and the Herbartians have always subordinated discipline to the content of instruction, and either denied the idea of a general formal discipline, or regarded it as properly a mere incident in instruction. However, so far as concerns the course of study, Herbart himself valued so highly on account of their content mathematics and the classics, the defenders of which have made especial use of the disciplinary argument, that his psychology of instruction has not been actively employed to dislodge from the curriculum that which was generally regarded as having principally disciplinary value. When we come to the question of method, on the other hand, his followers have in their development of his steps of instruction and his notions of correlation constantly emphasized the content, and subordinated entirely the form of instruction to its substance. Herbert Spencer, in maintaining that no subject should be taught for its disciplinary effect alone, but that this should be merely incidental, has fallen in with the passive attitude that the followers of Herbart have been wont to assume on this question.

In recent years the issue has again come to the front for various reasons, two of which may be mentioned more specifically. In the first place, the struggle among subjects of study has caused the various arguments advanced for each to be scanned more critically, with the result that the indecisiveness of the argument from formal discipline has become more apparent. Since all subjects seem able to use it equally well, it tends to be abandoned by such as can employ more effective weapons. In the second place, with the rise of psychological experimentation and its application to educational problems, the question of general disciplinary effects has presented itself as one problem of great importance accessible to the new methods. This experimentation has given to the notion of formal discipline the severest blow that it has so far suffered. The experiments bearing on the subject may be organized under the following headings. These are: (1) the effect of training certain muscles and sensory surfaces upon bilaterally symmetrical ones; (2) the effect of special training on the general accuracy and rapidity (*a*) of discriminations or estimates made by the senses, or (*b*) of motor adjustments; or (*c*) of memorizing; (3) the effect of special habits on general behavior.

1. As early as 1858 Volkmann found that training the left arm to discriminate touches that are so close as at first to be felt as one improved somewhat, although not equally, the power of the right arm in such discrimination. Experiments reported in *Yale Studies*, Vols. 2, 6, and 7, and in *Monograph Supplement* to the *Psychological Review*, No. 13, indicate that improvement through training in the grip of one arm, or in its power to lift a weight, or to

strike a target accurately with a foil, or to hit a dot, results in some improvement in the power of the other arm to do the same things.

2. (*a*) The experiments of Thorndike and Woodworth reported in *Psychological Review*, Vol. VIII, showed that training in discriminating words containing the letters *e* and *s* brought a little improvement in the rapidity of discriminating words containing *i* and *t*, etc., or misspelled words, or the letter *A* in a list of letters. Accuracy was also improved, but to a lesser degree. Training in discriminating English verbs brought a scarcely perceptible increase in the ability to discriminate quickly other parts of speech. Moreover, it produced a tendency toward omitting to note many instances of the word to be marked. The development through practice of the power to estimate by the eye the areas of certain rectangles improved considerably the power to estimate the areas of rectangles that were different either in size or shape, or both. So, too, the power to estimate heavier weights accurately was improved by practice with lighter ones; but training in estimating the length of lines did not invariably result in a gain in power to estimate longer or shorter ones. Coover and Angell report in the *American Journal of Psychology* for 1907 that training in tone discrimination improved the power to discriminate shades of color.

(*b*) Judd gives an account in the *Educational Review* of June, 1908, of an experiment in motor adjustment. The assistant in the experiment was placed so that he could not see one of his arms. Certain lines were then exposed to his vision momentarily, and he was required to place a pencil held in the concealed hand in the same direction as each line. After test experiments, he was allowed to observe one line more closely. The result was that he came to place the pencil more accurately than at first. When again the test series was exposed, it was found that errors similar to those originally made in the practice line were lessened. Errors of the opposite sort were increased. Moreover, the fuller exposure of one of this second class of erroneously represented lines failed to result in any improvement in the placing of the pencil. Experiments on geometrical illusions show that when by practice an illusion is corrected, the correction of the opposed illusion is interfered with, provided the experimenter is not aware of his corrections and their reasons. When, however, such knowledge exists, the correction is not hindered, but helped, by the practice.

Bergström reported, in the *American Journal of Psychology*, Vol. VI, an experiment in sorting cards. When by practice the speed of sorting had been improved, the experimenter tried interchanging the positions of the piles of the various kinds of cards. The result was slower sorting than in the original trial. Continued practice in interchanging positions, however, facilitated the shifting from one to the other. This result was also brought out by Münsterberg, who placed two inkwells on his desk, one full, the other empty. Having accustomed himself to the full one in one position, he interchanged them, with the result that the pen was for a time continually thrust into the empty well. In this and similar experiments Münsterberg found that practice in shifting improved the power to change from one habit to the other. Münsterberg's experiment is detailed in *Gedächtnisstudien*, Teil 1, *Beiträge*, Heft 4.

Bair reported in Monograph Supplement, No. 19, of the *Psychological Review* experiments with a typewriter. By using movable caps for the keys he changed the letter represented by any one at will. Practice in copying lists containing only six distinct letters increased the power to copy lists containing six different letters. In this experiment the change in the letters represented by the keys did much to remove any advantage of familiarity with the machine. Bair also found that practice in repeating the alphabet with the letter *n* spoken after each letter increased the power to repeat it with the letter *x* or the letter *r* thus introduced.

(*c*) Professor James published in Vol. I of the *Psychological Review* the results of certain experiments on memory. He found that practice in committing to memory certain verses of *Paradise Lost* did not improve his power to memorize other verses. In his case there was a slight loss, owing possibly to fatigue. With other experimenters there was no significant gain or loss. Ebert and Meuman practiced committing to memory nonsense syllables, noting the method of learning them that seemed most economical. They tested the effects upon the power to learn series of other nonsense syllables, letters, words, and lines of poetry or prose. Improvement was noted that in a general way was proportional to the similarity of test material with the practice material. Their results are published in *Archiv für die gesammte Psychologie*, Vol. IV. Dr. Fracker gives in *Psychological Review*, Monograph Supplement, Vol. IX, No. 2, the results of practice in remembering the order of four tones. He found that it improved the power to remember poetry, the order of four shades of gray, of nine tones, of nine shades of gray, of nine geometrical figures, of nine numbers, and of the extent of arm movements. Introspection indicated that the improvement was due to the development and mastery of a scheme of imagery by which the series might be held together. Winch experimented with British school children, reporting his work in Vol. II of the *British Journal of Psychology*. After being tested in power to memorize, a class was divided into two sections of equal ability. One was given practice in committing to memory 100 lines of poetry; a second test revealed that as a result of its practice it showed ten per cent more gain in power than the other section.

3. Bagley, in his *Educative Process*, Ch. XIII,

tells of an experiment in which school children were trained to be neat in arithmetic papers. They showed no tendency to improve the neatness of papers written in connection with other subjects.

On comparing the conclusions of these experiments, a substantial unanimity of opinion is apparent. It is agreed that wherever practice in one exercise leads to improvement in another, certain specific elements in both are identical and call forth identical responses which promote success in both exercises. In the case of the bilaterally symmetrical organs, the movements or discriminations tested were identical in character. This and the close physiological connection of the two parts through the nervous system made very extensive transference of acquired power inevitable. From their experiments in observation and estimate, Thorndike and Woodworth note the transference of such powers as spring from (1) " ideas of method or of general utility " acquired through training, such as the knowledge that one has a tendency to overestimate all areas and should make an allowance for it; or (2) " facility with certain elements that appeared in many other complexes," such as increase in the speed of eye movements. Coover and Angell emphasize the gain in power of concentrating attention by eliminating " useless kinæsthetic, acoustic and motor accompaniments of recognition." Such distracting elements appear when the strain on attention is severe, and ability to suppress them may, Angell thinks, enhance the power of concentration on a variety of difficult tasks in life. Professor James declares that all general improvement in memory arises from improvement in the methods of memorizing. One may account for his own failure to show transference by supposing that he had already mastered his general method of committing to memory, and that particular improvement was in his case due to methods that could be applied only to the practice material. The school children in the experiment of Winch show the converse case of little experience in memorizing and consequent great improvement in general methods. Ebert and Meuman practically agree with James. They trace the improvement in memorizing shown in their experiments to the gradual discovery by each of what was to him the most efficient method of memorizing, and the gradual elimination of other methods. Fracker finds that the improvement in method is due to " the consistent use of some form of imagery," which serves as a scheme for holding the attention and arranging the material to be remembered.

The identical elements that are thus distinguished may be divided into two groups, those of content and those of form. As examples of content elements we may mention sounds, colors, letters, nonsense syllables, words, objects, kinds of geometrical figures, standards of measurement, ideas, etc. As one grows familiar with such elements, the power to remember them, to attend to them when they appear in new situations, and to do what they suggest increases. The elements of form may be said to consist of the characteristics that various situations present as problems for the attacking mind. Thus we recognize one situation as a problem of memorizing, where from the nature of the material a particular method of committing to memory may be especially useful. Again, we may recognize the need of particular adjustments of perception, such as eye movements which we have already practiced. All situations demand adjustments of attention, some of which may invariably be necessary, while others may suit especially specific kinds of material.

We observe that elements of form and elements of content are equally specific, equally capable of definition. Moreover, both are capable of generalization; that is, both may appear in a variety of settings. The problem of general training is then quite as much one of discipline in content as it is of discipline in form. A better division of mental discipline would yield two phases, which we may denominate specific discipline and general discipline. Specific discipline consists in the analysis of the specific elements which are found to be decisive in determining certain reactions, and the practice by which the appropriate reaction is made the habitual response to each element thus discriminated. General discipline consists of training in the recognition of these decisive elements in a variety of situations.

The successful transference of any result of practice or experience depends upon both these phases of discipline. The failure to transfer neatness from arithmetic papers to others in Bagley's experiment is, doubtless, due to some lack of efficiency in both respects. The specific discipline failed in attaching the reactions connected with neatness with elements which in any situation were expected to call forth these reactions. The suggestion which in the practice was associated with neatness was not the thought of any exercise to be presented to the inspection of a teacher, but rather that of an arithmetic paper to be presented to a teacher *who insists on neatness*. Very naturally, when any of these factors was absent, the children failed to make the response which was associated with the entire group. Or if, as is likely, we may call the command of the teacher in question the critical suggesting stimulus to put forth the effort desired, then the reason for the lack of transference was that the identical element that provoked the desired reactions was absent from all the test material. No child would be neat unless there were some reason for it, and there was no reason for the effort involved in cases where it was not required. In the second place, the experiment illustrates the lack of any attempt to secure general discipline. If the children had been trained to be neat not only in arithmetic papers, but also in many others, and if many teachers had conspired to enforce this demand, it would have been much more likely that the children would have recognized in some new paper that they were required to present an occasion for the exercise of the virtue in question. Such general training would add to the effect of any amount of specific drill on neatness in any one connection.

The experiments on the effect of training motor adjustments brought out especially the fact of interference. This Professor Judd calls a form of transference. The effect of practice in one activity may be either to interfere with or to aid success in another. The causes of interference are twofold. The first is the failure to attach the reaction in question to the stimulus which is alone that to which it should constitute the response. The situation is not analyzed into the factors that make this or that response desirable. This difficulty is illustrated in Judd's experiment. Here the assistant does not realize that he is in his practice correcting mistakes in placing the pencil. Much less does he realize the character of the mistakes thus corrected. Hence the response of correction, which is learned in the practice, extends to cases where the opposite response should be applied. The various cases are not distinguished, and since all seem alike, the same correcting reaction is made to each. The second source of interference is found where in a new situation one should make to a certain stimulus a different reaction than the one originally learned. This is illustrated in the experiments of Bergström and Münsterberg. Here the different reactions were arbitrarily fitted to the stimulus. In the practical emergencies of life this form of interference arises because in different conditions the same stimulus should be responded to differently. In such cases one must learn to react according to circumstances. Successful transference depends upon the accurate discrimination of each element in the situation that is critical in reference to the reaction, and either the habit or the mental grasp and judgment that correlates these, and from this complex suggestion initiates the proper response.

From the practical point of view specific discipline resolves itself into the analysis and drill of the schoolroom. It may be said that here the work of our schools is least open to criticism. However, it may well be that the reactions that we wish to have transferred from schoolwork to life are not in the school attached to the same suggestions that should constitute their more universal stimuli in effective conduct. For example, the habit of neatness may be suggested by the merely adventitious suggestions of subject or teacher or schoolroom work, rather than by a sense of the general sort of situation that makes neatness desirable. But if the school often fails in specific discipline, much more likely is it to fail in that which is general. The habits that it teaches are provoked by suggestions that lie imbedded in a more or less constant set of surroundings. Outside this environment they may not be recognized. The physician who learns his art from a book may well fail to note in the sickroom the specific symptoms to which certain forms of treatment concerning which he has read apply. The strange situation distracts the attention, confuses the analytic power, and the mind fails to single out the specific clews that are associated with the proper therapeutic procedure. Teachers have come to recognize the difficulty, and in a general way the solution proposed is to make the atmosphere of the school resemble as much as possible that of life. When the conditions of learning approximate in nature and variety to those of application, one can be fairly well assured that successful transference will be at the maximum.

In conclusion, it may be said that the analysis and the experiments of psychology have done away with the conception of a vague general improvement associated with mental activity. Disciplinary values, like content values, are specific. They consist in learning the decisive suggestions to action, in associating therewith the proper responses, and in learning to recognize these suggestions in new situations. Thus the school has before it a definite, even though a difficult problem. So far as discipline is concerned, this problem means first the selection of the reactions that have the greatest value, second the determination of what is the true and universal occasion for each reaction, together with modifying or exceptional conditions. Finally, we have the problem of drill and of application, of specific and of general discipline, such as will insure the successful utilization of the habits which the school has elected to teach.

E. N. H.

See Ability, General and Special; Drill; Effort; Habit; Values, Educational.

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FORMAL EDUCATION. — A term applied to any training or education which is given in a direct, conscious, and systematic manner, as opposed to the kind of development which is incidental to life. In this sense what one learns outside of school represents a child's informal or incidental education;

what he gains through tutoring or at school is his formal education. Thus the end of school life is spoken of as the close of the period of formal education. The same fundamental distinction is also applied in the classification of the influences of school life itself. What the pupil gains through the direct and systematic instruction of the classroom, that is, through the study of the subjects of the curriculum, is his formal instruction, as opposed to the incidental influences of school life, which are exerted through the social life, the playground activities, the government and the discipline of the school.

Formal instruction or education, however valuable, needs to be supplemented by many and varied experiences outside the classroom. An individual's complete education is gained through the contacts of his whole life under whatever institutional influences these may be gained. School education is only partial; it fails to provide a complete series of experiences. While it gives much in a thoroughly accurate and systematic form, it frequently fails to give a practical organization to knowledge so that the facts and principles gained are closely associated with actual problems and ordered so as to provide a properly controlled conduct with reference to them. The formal education of schools in particular tends to restrict itself to the intellectual level of consciousness ; the sensibilities which evaluate situations and the skilled actions which modify them are too often underemphasized by classroom instruction. Modern educational theory recognizes this truth when it suggests that the complete curriculum of the school consists of all the school activities, whether they occur on playground or in recitation; and modern practice, in line with this belief, encourages supervised play, self-government, and various forms of organized sociability among children. In a similar manner, the influences of home, neighborhood, religious and other modes of institutional life are regarded as distinctly necessary supplements to the school. H. S.

See COURSE OF STUDY, THEORY OF; EDUCATION; EDUCATION AND INSTRUCTION; END IN EDUCATION; ENVIRONMENT; FAMILY EDUCATION; FORMAL DISCIPLINE.

FORMAL METHODS. — A process of teaching which follows a more or less artificial order or manner. The *five formal steps of the recitation* constitute a classic instance of a formal procedure in teaching. Many other examples might be cited. Teaching the addition combinations in the order in which they appear in systematic tables rather than in the order of their need is a case in point. Learning to memorize a poem line by line rather than by wholes or thought units is another. Spelling isolated words in lists or columns is a formal mode of procedure, whereas spelling words in the context of meaningful sentences or paragraphs is a natural method. The use of formal methods in teaching procedure has its value in giving the teacher a larger control of his own teaching technique or of the mental activities of children. Beginners in teaching find it very essential to proceed by given steps so as to avoid diffuseness. And all teachers find it useful to separate the mastery of a subject into steps, in order that specific points of difficulty may be located. Thus the full written expression of the solution of a problem in arithmetic is quite unnatural, as many calculations could be performed mentally; but a full formal statement is valuable in revealing the child's whole activity, and so exposing each weakness requiring correction. Too exclusive a use of formal methods was characteristic of early American teaching. Present-day practice makes a relatively larger use of less formal and therefore more natural methods. H. S.

See NATURAL METHODS; RECITATION, METHOD OF THE.

FORMAL STEPS OF PRESENTATION. — See APPERCEPTION ; METHOD, GENERAL.

FORMAL SUBJECTS. — See FORM AND CONTENT.

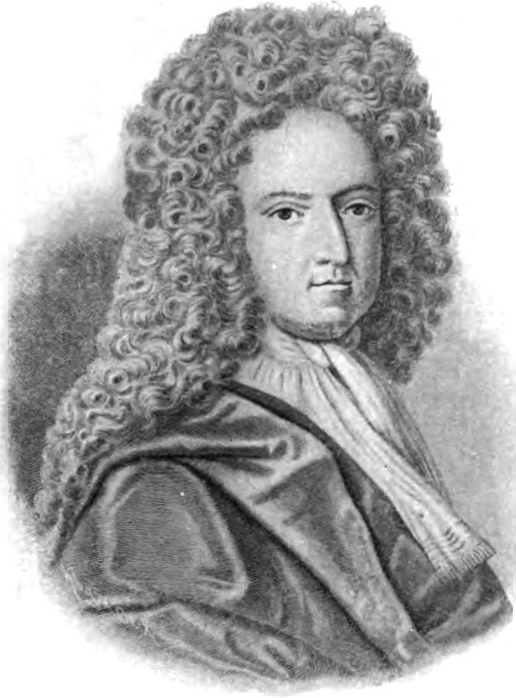
FORMAL VALUES. — See CONTENT SUBJECTS ; COURSE OF STUDY, THEORY OF ; FORM AND CONTENT.

FORMAL WORK. — See CONTENT SUBJECTS ; COURSE OF STUDY, THEORY OF ; FORM AND CONTENT.

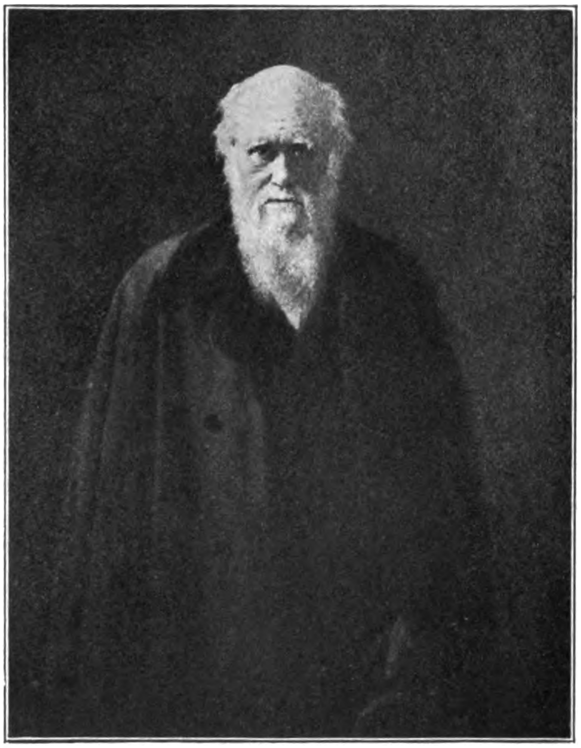
FORMALISM. — See FORM AND CONTENT.

FORMATIVE PERIOD. — See INFANCY.

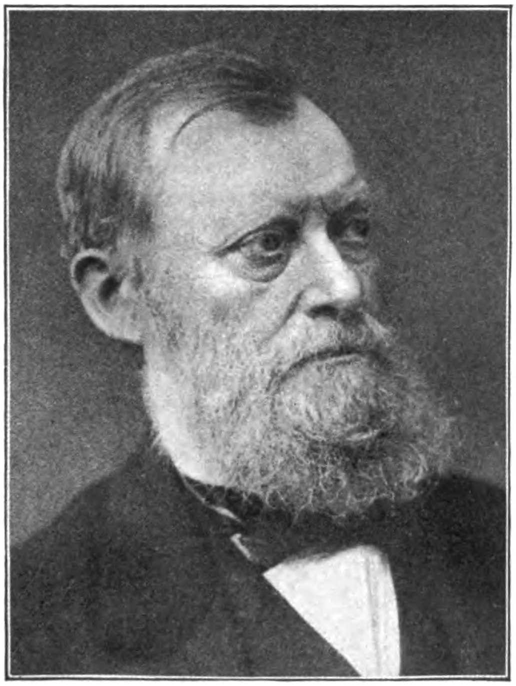
FORSTER, WILLIAM EDWARD (1818-1886). — English educational statesman; was born at Bradpole, Dorset, the only child of William Forster, a devoted and widely traveled minister of the Society of Friends, who died in 1854 in East Tennessee while on a mission urging the abolition of negro slavery, and of Anna, sister of Sir Thomas Fowell Buxton. The penetrating influences of a home life which was at once austerely simple, cultivated, natural, fervent, unflinchingly consistent, and permeated by the practical idealism of the Society of Friends, fixed Forster's character and tone of mind, making him, like John Bright, a typical Quaker statesman of the Victorian era. Throughout his life Forster, like Ruskin, was sensitive to the influence of observant and clear-sighted women, and never equally at his ease or in sympathy with the men with whom he had chiefly to act in political affairs. Brought up in a religious society in which men and women had equal influence, he never adjusted himself afterwards to the different standards which prevailed in those wider circles of Eng-



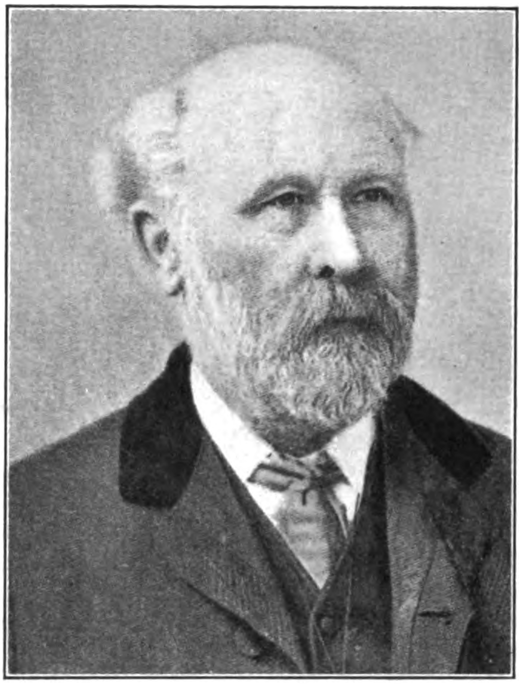
Daniel Defoe (1659 ?–1731).
See p. 281.



Charles Darwin (1809–1882).
See p. 252.



William E. Forster (1818–1886).
See p. 647.



Sir Joshua G. Fitch (1824–1903).
See p. 617.

A Group of English Educational Leaders.

lish life in which the views and interests of men were traditionally paramount. Hence, in his political career, Forster, though universally respected, was constantly moved to an irritation which a more supple character would have concealed, but which his native awkwardness of manner rendered conspicuous. His passion for public affairs, like his father's missionary zeal, was free from any base taint of vanity or self-interest, and sprang from an intense desire to guide public policy by what he believed to be the principles of the Christian faith. But his evangelical ardor for social reform quickly came into conflict with some of the complex forces which were at work in the English political struggle, and the power, or even the existence, of which his early training had not prepared him to foresee.

Educated at home till thirteen, Forster went for five years to Quaker schools in Bristol and Tottenham. In consequence of his father's misgivings as to a political career for his son, the youth was sent into the woolen business, first at Norwich, then at Darlington, and finally, in 1841, at Bradford, Yorkshire, where he joined William Fison, a woolen manufacturer, in a partnership which lasted till death. During his business career at Bradford, Forster was energetic in the study of social questions, and was brought into personal contact with Robert Owen, Thomas Cooper, the Chartist, Frederick Denison Maurice, and John Sterling, and into intimacy with Thomas and Jane Welsh Carlyle. Thus, while still a provincial manufacturer engaged in an anxious business struggle, he was admitted to the circle of those who, on the progressive side, were among the intellectual and moral leaders of national life. In 1850 he married Jane Martha, the eldest daughter of the late Dr. Thomas Arnold of Rugby. Taking, after his marriage, an increasing part in public affairs, he became prominent as an advocate of Parliamentary reform and as an eager champion of the Abolitionist Party in the United States, with whose policy in regard to negro slavery he had inherited from his father and from his mother's family a profound sympathy. In 1861 he was elected Member of Parliament for Bradford, which city he continued to represent till his death in 1886. With Bright and Cobden, he threw the whole of his Parliamentary influence against any attempt to recognize the Confederacy in the American Civil War. In 1865 he first entered office as Under-Secretary for the Colonies in Lord Russell's government, and, from the experience thus gained, became a lifelong advocate of imperial federation, his acceptance of which ideal, in some ways so foreign to Quaker sympathies, may be traceable in part to the influence of the Arnold family tradition. When Mr. Gladstone became Prime Minister, in November, 1868, Forster joined the government as Vice-President of the Committee of Council on Education, but was not then admitted to the Cabinet, a fact indicating a singular underestimate of the importance of the education bills, the preparation of which, through his place in the government, fell chiefly to him.

Two great measures give Forster a permanent place in the history of English education. In 1869 he conducted the Endowed Schools Bill through the House of Commons. (See for details ENDOWED SCHOOLS ACTS.)

On Feb. 17, 1870, Forster introduced, on behalf of Mr. Gladstone's government, the Elementary Education Bill. (See for details ENGLAND, EDUCATION IN.) It was the outcome of many years of philanthropic agitation, and, in its original form, bore marks of amateurish draftsmanship, combined with prophetic but premature anticipation of the future trend in English local government. It is said that Mr. Gladstone, though Prime Minister, could hardly be induced by his colleagues to give his mind to the details of the problem before the bill was introduced. Forster, though not a member of the Cabinet, bore the brunt of the business. The object of the bill was, in Forster's words, "to complete the voluntary system, to fill up gaps, sparing the public money where it can be done without, procuring as much as we can the assistance of the parents, and welcoming as much as we rightly can the coöperation and aid of those benevolent men who desire to assist their neighbors." In preparing the measure, Forster was greatly helped by his friend, Canon Jackson of Leeds, and showed himself to have inherited the tradition of Sir James Kay-Shuttleworth, who always believed that the progress of English national education would be best furthered by a succession of concordats between the great religious denominations and the State. It is clear that Forster's mind wavered between two different conceptions of public elementary education. Was it to be a great structure of educational discipline regulated by the State with the aid of local authorities, providing the basis for secondary and technical education, and closely related at all points to those other branches of the public service concerned in social welfare? Or was it to be, in the main, an eleemosynary work, conducted in great measure by the churches, maintained partly from the voluntary subscriptions of the benevolent, with the aid of enlarged grants from the State and supplemented by subsidies from local rates, but content with a somewhat low standard of attainment, and shorn of costly ambitions to branch out into secondary and higher education ? The bill was a compromise between these two views. Nothing else was possible at the time. The civic ideal in education was still in its infancy. The aid of the religious bodies and of the benevolent subscriber was still indispensable to success, while the opposition of the churches would have been fatal to the Parliamentary prospects of the measure, if not in the House of Commons certainly in the House of Lords. But Forster's hesitancy between these two ideals lay deep in his political consciousness. On one side he was drawn toward bold state action; on the other side he was attracted by the generosity of the religious bodies and by the varied charities of private benevolence. Probably the hidden cause which produced this hesitation between two conflicting ideals was his profound belief in the necessity of religious influences in national education. He foresaw that any elaborate state organization of schools would inevitably tend to secularization. On the other hand, he perceived that voluntary denominational effort had completely failed to grapple with educational destitution, and must therefore be supplemented by state action, combined with the efforts of local authorities. His speech on the first reading reflects this duality of purpose. It also shows that he had little conception of the inevitable cost of the system of national education which he was introducing. "After all," he said, "it is but a very small matter as regards the rate. An education rate will save the prison rate and the pauper rate. It will not be a special rate, but a charge on the poor rate. But should it exceed 3*d.* in the £1 (and I do not believe it will amount to anything like that sum in the vast majority of cases), then there is a clause in the bill which stipulates that there shall be a very considerable extra grant out of Parliamentary votes."

Throughout the passage of the bill, Forster's personality had great influence upon the course of events. He was profoundly interested in school questions. He was intimate with many of those who had long experience in school administration and in teaching. He stood midway between the advocates of universal public control and the friends of voluntary enterprise. He was a link between the two conflicting ideals. He was a mediator between the two opposing forces in national life. He was a democrat, but not a secularist; an ardent supporter of religious influences in education, but at the same time a believer in the possibility of united Christian teaching, the spirit of which would transcend denominational distinctions. In this last respect the influences of his Quaker up-bringing were clear, just as in his inclination toward state effort in organizing national education upon broadly Christian lines, we can see the influence of the ideals of Dr. Arnold of Rugby.

With the rest of Forster's political career this article is not concerned. It must suffice to say that no more courageous and disinterested Minister ever served in a British government. M. E. S.

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FORT WORTH UNIVERSITY, FORT WORTH, TEX. — A coeducational institution, chartered in 1881 as the Texas Wesleyan College, the present title being secured in 1889. There are maintained as part of the university a sub-academy, an academy, college of liberal arts, and schools of commerce, pharmacy, and nursing. Students are admitted to the college by certificate or on examination requirements equivalent approximately to fourteen units. Degrees are granted in arts, science, philosophy, literature, and medicine. The college has a faculty of thirty-two.

FORTUNATUS, VENANTIUS. (HONORIUS CLEMENTIANUS). — Christian poet; born in Gaul 530 A.D. He studied grammar, rhetoric, and poetry at Ravenna under the best masters. His pilgrimage to the tomb of St. Martin of Tours is described in his principal poem. He lived for some years at the court of Sigebert, King of Austrasia, in honor of whose wedding he composed an epithalamium. Here he acquired great reputation as a poet. Later on he was entertained by Queen Rhadegund at the Abbey of St.Croix, which she had founded at Poitiers, where he continued his literary and philosophical pursuits with ardor. He composed many lives of the Saints, theological treatises, and poems. He wrote many Latin hymns, the most famous of which are the *Vexilla Regis* and *Pange Lingua.* He was the first to use rhymes successfully and to master the trochaic tetrameter. His poetry was the expiring effort of the Latin Muse in Gaul, and he was the last poet of the period preceding Charlemagne. His writings are valuable as pictures of Merovingian society. In the frequent attacks which were made on pagan writings as unsuitable for school use, the works of Fortunatus, particularly his hymns and poems on the Saints, came to hold an important position in the curriculum. Just before his death he became Bishop of Poitiers. (See Wimpheling, *Isidoneus Germanicus*, ch. 21.)
W. R.

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Migne. *Patrologia*, Vol. LXXXVIII.

FOUNDATION READERS. — Reading books used in the first year's work in teaching children to read; they usually include a primer and a first reader. They are specially arranged so as to give a simple context well within the experience of the child and expressed in words the sound of which is easily learned by the pupil. These foundation readers aim to give a large power in the ready recognition and pronunciation of new words at sight. They are usually, though not always, arranged on a phonetic basis. Such basal readers aim to give a fairly thorough mastery of the mechanics of reading, so that subsequent reading may be mainly concerned with the getting of the thought. H. S.

See Reading, Teaching Beginners.

FOUNDLING HOMES. — See Orphans, Education of.

FOVEA CENTRALIS. — The center of clearest vision in the retina. At this point the retina is made up of cones and sensory cells only. The name is due to the fact that the retina is at this point slightly depressed. C. H. J.

See Eye; Nervous System.

FOWLE, WILLIAM BENTLEY (1795–1865). — Educational journalist and author; received his education in the public schools of Massachusetts and at Caleb Bingham's school (*q.v.*). He organized the first intermediate school in Boston, and was active in the monitorial school movement (*q.v.*). For many years he was connected as associate editor with the *American Annals of Education* (*q.v.*). He was the author of thirty-six school books, including readers, speakers, spellers, geographies, grammars, etc. W. S. M.

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FOX, GEORGE. — Friends, Educational Influence of Society of.

FOX, WILLIAM JOHNSON (1786–1864). — An English preacher, politician, and man of letters. He was strongly interested in philanthropy and social reform, and belonged to the Manchester school of thought. On his election to Parliament as member for Oldham in 1847, he took up the question of education, and in 1850 introduced a bill to provide for compulsory secular education. He advocated the establishment of free schools supported by local rates wherever inspectors reported an insufficiency of schools. Teachers were to be appointed, paid, and dismissed by school committees. Where local bodies failed to establish schools, the Committee of Council was to step in. The progress of teachers was to be encouraged by the publication of annual reports by the Committee of Council. Religious education, however, was not to be given in rate-maintained schools, although the State might support denominational schools for success in secular subjects, and arrangements might be made for religious education of children of rate-aided schools at convenient times. Fox supported his bill by a manifesto of London workingmen against sectarianism. He distinguished between education and instruction or acquisition of knowledge, and emphasized the importance of efficient teachers, no matter how perfect the organization of a school system might be. The bill was rejected by a large majority. In 1851 Fox moved in the House of Commons "that it is expedient to promote the education of the people, in England and Wales, by the establishment of free schools for secular education, to be supported by local rates, and managed by committees elected specially for that purpose by the ratepayers." On this occasion he pointed out that sufficient provision was made for religious education in the fifty-ninth canon, and referred to the anxiety of the opposition for the religious education of children other than their own. The work begun by Fox, who represented the opinion of a large body of people in the north of England, was taken up by Lord John Russell. But it required nearly twenty years more before these views were to be realized.

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FRACTIONS. — History of Common Fractions. — In general, it may be said that the ancients avoided fractions almost entirely, and by an expedient that was very ingenious. Assuming a convenient unit of measure, let us say one that corresponds to the modern yard, they then took some convenient unit that was a fractional part of the first one, like the foot, and another that was a fractional part of the second, like the inch, and so on. These smaller units were really fractions of the larger ones, although they were not looked upon in that light. Instead of thinking of 2½ feet, the ancients thought of 2 feet 6 inches, and so for other fractions. Thus arose the system of compound numbers (*q.v.*), which played such an important part in all metrical work from earliest times to the nineteenth century. Just at present we are in a period that will see the decay of compound numbers, these being replaced by the modern device of the decimal fraction mentioned below. With the idea explained above, the Romans, for example, generally divided their units into twelfths, of which we have a relic in the inch and in the ancient ounce. This radix was chosen because it allows its half, thirds, and fourths to be represented as integers, thus covering the most important business fractions.

The arrangement of compound numbers was not sufficient, however, for scientific purposes, and to answer these demands there early came into existence several kinds of fractions, of which two still remain, the common and the sexagesimal fractions. It is difficult to say which of these is the earlier, since the origin of each is lost in the maze of ancient history. It is natural to think that the common fraction was the first, as is probably the case; but in some respects the sexagesimal is simpler than the ancient common fractions with which we are familiar, and hence may have had a very remote origin. For example, it is simpler to think of 2 hours 23 minutes 17 seconds than of $2\frac{1397}{3600}$ hr.

The earliest extant work dealing with fractions is the Ahmes (*q.v.*) papyrus, of about 1700 B.C. At this time only unit fractions were recognized, with the single exception of two-thirds, for which there was a special symbol. These unit fractions were commonly indicated by a special symbol, under which the denominator was written. Ahmes, however, recognized the necessity, for purposes of multiplication and division, of having the quotients of 2 by a series of numbers, and so he prepared a table of these quotients expressed in unit fractions. Thus he states that $2 \div 43 = \frac{1}{42} + \frac{1}{86} + \frac{1}{129} + \frac{1}{301}$ so that he has essentially a table of fractions with the numerator 2. It will be noticed that approximate values of the fraction in question may be obtained by taking the sum of the first n of the unit fractions. The use of unit fractions extends over a long period. In the Akhmim papyrus (*q.v.*), written upwards of twenty-five hundred years after the original of the Ahmes work, unit fractions are given in essentially the same manner as in the older treatise. In the Middle Ages in Europe such forms were known as simple fractions (*simplices fractiones* in some of the manuscripts), and even as late as 1559 Buteo, a mathematician of some merit, gives the square of $1162\frac{1}{8}$ as $1350534\ \frac{1}{2}\ \frac{1}{64}$. The unit fraction is also found very early in India. In a rule for the approximate quadrature of the circle, perhaps as early as the eighth century B.C., the value of π is given as $\left(\frac{7}{8} + \frac{1}{8\cdot 29} + \frac{1}{8\cdot 29\cdot 6} + \frac{1}{8\cdot 29\cdot 6\cdot 8}\right)^2$, which is equivalent to 3.0881 · · · (See R. C. Dutt, *A History of Civilization in Ancient India*, London, 1893, Vol. I, p. 273.)

In Rome the commercial fractions were referred to the *as*, which was looked upon as one of the principal units. Sixteen *asses* made a *denarius*. A twelfth part of the *as* was the *uncia* (ounce). Hence the Romans had the following scheme based upon unit fractions:—

Multiples of the as	*Name*
1 *as* = $\frac{1}{16}$ *denarius* = $\frac{1}{24} + \frac{1}{48}$	*Denarii semuncia et sicilicus*
2 *asses* = $\frac{1}{8}$ *denarius* = $\frac{1}{12} + \frac{1}{24}$	*Denarii uncia semuncia*
3 *asses* = $\frac{3}{16}$ *denarius* = $\frac{1}{6} + \frac{1}{48}$	*Denarii sextans sicilicus*
etc.	etc.

Submultiples of the as

$\frac{1}{2}$ *as* = *semis*	$\frac{1}{10}$ *as* = *dextans*
$\frac{1}{3}$ *as* = *triens*	$\frac{1}{12}$ *as* = *uncia*
$\frac{1}{4}$ *as* = *quadrans*	$\frac{1}{288}$ *as* = *scriptulum*
etc.	etc.

Each of these fractions had its symbol, and a list of these symbols as they existed in the early Middle Ages may be seen in the work often attributed to Bede (*q.v.*), *De ratione Unciarum.* (See the Paris edition of his *Opera omnia*, 1862, Tomus I, p. 699.) On coins the half was commonly represented by *S* (for *semis*); the third by four disks, ● ● ● ●, meaning $\frac{4}{12}$; the fourth by three disks, meaning $\frac{3}{12}$; the sixth by two disks, and the twelfth (*uncia*) by one disk. Fractions did not, however, play much part in the mercantile life of the Romans. Varro (116–28 B.C.), in his work on the Latin language, mentions only twelve fractions, while Metianus (fl. second century A.D.) gives only two more. The learned Isidorus of Seville (*q.v.*), in the seventh century, mentions only eight, and five hundred years later Adhelard of Bath (*q.v.*) gives only twenty-four.

Our method of writing common fractions is due essentially to the Hindus, although they did not use the bar. Brahmagupta (*q.v.*), writing in the seventh century, used $\begin{smallmatrix}5\\6\end{smallmatrix}$ for $\frac{5}{6}$, and Bhaskara (*q.v.*) did the same. So in the Sanskrit manuscripts generally we find no bar used, even in relatively modern times. The Arabs introduced the bar, but they did not use this form exclusively. The earlier manuscripts often follow the Hindu form, and Rabbi ben Ezra, deriving his knowledge from these earlier writers, also omitted the bar. The Greeks and Romans were, of course, unaware of it, although the former had a very good fraction system. Early Renaissance writers occasionally attempted to combine the Roman numerals with the Arabic forms, as in the case of $\frac{\text{III}}{\text{IIII}}$ and $\frac{\text{II}}{\text{VII}}$, as in the work of Köbel (1518). Some of the early printed arithmetics omitted the bar entirely (as in the Bamberg arithmetic of 1483), others omitted it in small fractions, while retaining it in large ones (as in Rudolff's work of 1526), and others omitted it in the case of $\frac{1}{2}$ of $\frac{2}{3}$ of $\frac{3}{4}$, which was written $\frac{1}{2}\ \begin{smallmatrix}2\\3\end{smallmatrix}\ \begin{smallmatrix}3\\4\end{smallmatrix}$. Thus Hylles (1600) remarks: " And here you see the first fractions to wit $\frac{1}{2}$ being a true fraction, written with his lyne as it ought to be — and the other two that is to say $\begin{smallmatrix}2\\3\end{smallmatrix}$ and $\begin{smallmatrix}3\\4\end{smallmatrix}$ — to be written without any lyne as their vse and order is."

The name *fraction* is from the Latin *frangere*, to break. It is, therefore, a broken number, a fragment. The name has not been at all universal. Boethius, following the earlier classical writers, used ratios in his scientific treatment of fractions. He treats of the commercial fraction under the head *De Minutiis.* This use of *minute* for fraction was very common among medieval writers, not merely in respect to sexagesimal fractions, but also in respect to common fractions. Thus in the twelfth century Adhelard of Bath used *minuciae*, while at about the same time the learned Spanish Jew, Johannes Hispalensis (John of Luna), preferred *fractiones.* At the time of the first printed books, the two names were used interchangeably. Thus Huswirt (1501) says that *Minutia siue fractio nihil* *aliud est qz. pars integri,* and the popular Gemma Frisius (*q.v.*) speaks of *fractiones, minutias aut partes.* In English, the word "fraction" appears early, Chaucer in his *Astrolabe* (1391) using the form *fraccion.* The Italians made use of another Latin root, *ruptus,* (whence rupture, a break), and derived the word *rotto* (plural *rotti*). Thus Paciuolo (*q.v.*), in 1494, used *rotti* generally, but also *fractioni* and *fracti.* From the same root came the early French *roupt, rompu,* and *routz,* and the Spanish *rocto* The Germans followed their usual plan of taking Teutonic roots instead of Latin. Grammateus (1518), for example, has a chapter *Von Prüchen,* in which he speaks of *ein iglicher pruch* (*welcher man in latein fraction nennet*), and Adam Riese (*q.v.*) speaks of *ein gebrochene zal.* The Dutch followed the German lead and the earlier books have such forms as *die ghebroken ghetalen* (Raets, 1576) and *Ghebroken* (Mots, 1640). The Teutonic custom affected the earlier English writers, so that in two anonymous arithmetics of 1546 and 1574 we find the phrase "in hole numbers or in broken." Similarly Baker (1568) speaks of "fractions or broken numbers," and of a "broken of a broken." Even in the first native American arithmetic (Greenwood, 1729) there is a chapter entitled "Fractions, or Broken Numbers," and the same expression appeared in Pike's well-known arithmetic in editions well into the nineteenth century.

The prefix "common" was originally used to distinguish the fractions from the sexagesimal forms. The medieval Latin expression was *fractiones vulgares,* whence the "vulgar" fractions of the English, an expression that was generally used in the United States until the middle of the nineteenth century. The prefix "common" is not so recent as is sometimes thought, for Digges, as early as 1579, speaks of "the vulgare or common Fractions."

The common definition of "fraction" has been, and is, in substance, one or more equal parts of a unit. The more general definition, as a special indicated division, is a later development, and as an indicated division is still later. Ramus (*q.v.*), for example, says that in dividing a smaller number by a greater one, a quotient exists that is less than unity, and this is a *fractio sive pars.* The fusion of the two ideas, of part and quotient, is relatively recent. (For a discussion, see Bobynin, in the *Bibliotheca Mathematica,* Vol. XIII, 2, p. 181.)

The names of the terms have undergone considerable change. The medieval Latin names for numberer (*numerator*) and namer (*denominator*) came into common use after the Arab fractions became generally known, and particularly among scholars in the fifteenth century. Since they were found in the early printed Latin arithmetics, they were generally adopted by the Latin races. The Teutonic languages, however, generally translated these terms, and they appear in the early German as *Zeler* and *Nenner* (as in Stifel's *Deutsche Arithmetik* of 1545), and in the early Dutch as *teller* and *noemer* (as in the work of Petrus of 1567) or *Telder* and *Nommer* (as in the work of Raets, 1576). In English an attempt was made to depart from the Latin form, as when Hylles (1600) wrote: "Numerator which also for more shortnesse is sometimes called the Topterme or top only: and that the lower term is vsually called the Denominator or Base." A similar use of top and base is found in the well-known Latin arithmetic of Gemma Frisius (1540), where *superiori* and *inferiori* are also used. It is to be hoped that some shorter names than numerator and denominator may some time come into general use, but possibly the decay of the common fraction (save in very simple cases) will render this unnecessary.

The reduction of fractions to lowest terms was a problem of considerable difficulty before the invention of the decimal fraction. Thus so good a writer as Clavius (*q.v.*) used the fractions $\frac{109207693}{300500000}$ and $\frac{9432500}{144060000}$ in examples that were of a practical nature. In order to reduce such fractions to lowest terms, for the purpose of operating with them, it was necessary to find the greatest common divisor (*q.v.*) of the two terms by the long division method, and hence the presence of this topic in the older arithmetics.

The sequence of operations in fractions has generally been regulated by analogy to the sequence in treating integers, beginning with addition. Not infrequently, however, the sixteenth-century writers followed the more psychological plan of beginning with the multiplication of fractions. Thus Robert Recorde (*q.v.*), who wrote his *Ground of Arts* about 1540, says: "There is an other ordre to be folowed in fractions then there was in whole numbres. for in whole numbres this was the ordre, Numeration, Addition, Subtraction, Multiplication, Diuision and Reduction. but in fractions (to folowe the same aptnesse in procedyng from the easyest woorkes to the harder) we muste vse this ordre of the workes, Numeration, Multiplication, Diuision, Reduction, Addition, and Subtractiō" (1558 edition, folio R iiii, v.). Of late we have returned to the suggestion of not beginning with addition, and all primary arithmetics to-day show how to take a fraction of a fraction before adding two or more fractions. Of the operations, the most difficult to explain is division. The old method was to reduce the fractions to a common denominator and then divide the numerators, and this is the plan occasionally pursued in teaching beginners to-day. The Hindus knew the process of multiplying by the inverted divisor, as witness Brahmagupta's (*q.v.*) work of the seventh century; but it was only partially recognized in the Middle Ages in Europe. It reappears as a standard method in Stifel's (*q.v.*) *Arithmetica Integra* in 1544.

Complex fractions are not so modern as might be thought to be the case, for Rabbi ben Ezra gives examples of them in his *Sefr ha-Mispar*, written in the twelfth century.

History of the Decimal Fraction. — The decimal fraction has come into general use only within a century, although the theory was perfected by 1600. One of the most interesting of the early influences tending to the invention of the decimal fraction was a certain rule for the extraction of roots, expressed in modern symbols by $\sqrt[n]{a} = \frac{\sqrt[n]{a\,10^{kn}}}{10^k}$. In particular, $\sqrt{3} = \frac{\sqrt{30000}}{100}$ or $\frac{\sqrt{3000000}}{1000}$, the actual process of extracting the root being quite like our present one with decimals. This rule was known to the Hindus, and to Johannes Hispalensis in the twelfth century, and it appears again in the works of Johann von Gmunden (*c.* 1380–1442), Peurbach (1423–1461), and their successors until the close of the sixteenth century. The most interesting step from this rule in the direction of the decimal fraction appears in certain tables of square roots, in connection with which the statement is made that the numbers having been multiplied by 1,000,000, the roots are 1000 times too large.

Another influence leading to the invention of the decimal fraction was the rule for dividing numbers of the form $a \cdot 10^n$, attributed by Cardan (1539) to Regiomontanus. This appears in several manuscripts of the fifteenth century, as in the case of $470 \div 10 = 47$, and $503 \div 10 = 50\frac{3}{10}$. Borghi (1484) elaborates this rule, but it appears in its most interesting form in the rare arithmetic of Pellos (1492), who unwittingly made use of the decimal point for the first time in a printed work.

Later writers commonly used a bar for this purpose, as was the case with Rudolff (1526), Cardan (1539), Cataneo (1546), and various other writers. Even as late as the 1816 edition of Pike's *Arithmetick* (New York, 1816), 46,464 is divided by 7000 thus: —

$$\begin{array}{r|l} 7\,|\,000)46 & 464(6\frac{4464}{7000} \\ \underline{42} & \\ 4 & 464 \end{array}$$

The first man who gave evidence of having fully comprehended the significance of all this preliminary work seems to have been Christoff Rudolff, whose *Exempelbüchle* appeared at Augsburg in 1530. In this he solves an example in compound interest, and uses the bar exactly as we would use a decimal point to-day. If one man were to be named as the best entitled to be called the inventor of decimal fractions, Rudolff might properly be the man. His work, however, was not appreciated, and apparently it was not understood, and it was not until 1585 that a treatise upon the subject appeared. The first to show by a special treatise that he understood the significance of the decimal fraction was Stevin (1548–1620) who published a work upon the subject in Flemish, followed in the same year (1585) by a French translation. This work, entitled, *La Disme*, sets forth the method by which all business calculations involving fractions can be performed as readily as if they involved only integers.

The historical steps in the invention of the decimal fraction may be summed up as follows: Pellos (1492) used a decimal point where others had used a bar, but the idea of the decimal fraction was not developed by him. Rudolff (1530) operated with decimal fractions clearly, using a bar for the separatrix, but he did not write upon the theory. Stevin (1585) wrote upon the theory, but had a poor symbolism. About 1600 several writers attempted to improve the symbolism, and Bürgi, in 1592, actually used a comma for the decimal point, without the common sexagesimal marks, and comprehended the nature and advantages of these fractions. It is thus difficult to pick out the actual inventor, although Rudolff and Stevin are entitled to the most credit for bringing the new system to the attention of the world. It may also be said that the symbolism is by no means settled even yet. In England $23\frac{45}{100}$ is written 23·45; in the United States it appears as 23.45; on the Continent it is given as 23,45, or often as 23_{45}. Indeed, in America, we commonly write $\$23.\underline{^{45}}$ instead of $23.45, to avoid forgery.

History of Sexagesimal Fractions. — The later Alexandrian astronomers used a system of fractions based on sixtieths, and these are known as sexagesimal fractions. Thus they wrote, in their notation, $2^\circ\ 17'$, for $2\frac{17}{60}$, $2^\circ\ 17'\ 45''$ for $2 + \frac{17}{60} + \frac{45}{3600}$, and $2^\circ\ 17'\ 45''\ 30'''$ for $2 + \frac{17}{60} + \frac{45}{3600} + \frac{30}{216000}$. The medieval writers carried these fractions much further, as in the work of Sibt el-Mâridimi (Bedr ed-Dîn Abou Abd-Allah Mohammed ben Mohammed ben Ahmed, of Cairo, *c.* 1450), where $47^\circ\ 50' \div 1^\circ\ 25'$ is given as $33^\circ\ 45'\ 52''\ 56'''\ 28^{\text{iv}}\ 14^{\text{v}}\ 7^{\text{vi}}\ 3^{\text{vii}}\ 31^{\text{viii}}\ 45^{\text{ix}}\ 52^{\text{x}} \cdots$, repeating after 31^{viii} (which is his last figure), — an interesting example of a circulating sexagesimal. That these fractions came originally from Babylon is generally assumed, the story seeming to have started with Achilles Tatius in the second or third century of our era. There is, however, no good authority for the statement, although the Babylonians used a mixed decimal and sexagesimal notation. In the Middle Ages these fractions were called physical or astronomical fractions. The Greek astronomers called $\frac{1}{360}$ of a circumference a *μοῖρα*, Latin *gradus*, whence probably our word *degree* (*de*, down, + *gradus*, a step). The Latin writers called $\frac{1}{60}$ of a degree *pars minuta prima*, and $\frac{1}{3600}$ of a degree *pars minuta secunda*, whence, by evident abbreviation, we have our minutes and seconds.

The Teaching of Fractions. — As will be seen from the preceding historical sketch, the subject of fractions has always been a stumbling block in the teaching and learning of arithmetic. The ancients avoided the difficulty by the use of compound numbers, but the demands of modern life necessitate more subtle divisions of the unit than are feasible by the ancient method. The crude system of compound numbers gradually gave way to the common fraction for many purposes; that in turn gave way to the sexagesimal fraction for finer divisions of the unit; and all three are now giving way to the decimal fraction. We have much less of compound numbers than was found a few years ago; our sexagesimal fractions are now limited to the expressing of time and of angle measure, and the latter will soon give place to the decimal divisions; and our common fractions are coming to be limited to the ordinary cases of practical measurement, the denominator rarely exceeding 64. With all this change has come the increasing importance of the decimal fraction, as witness the growth of such tables as those of the metric and monetary systems of the nineteenth century.

This being the case, several large movements are at present manifest in the teaching of fractions: (1) Common fractions are no longer taught as a topic at a single period in the pupil's progress, but they are scattered through the first five years of the elementary school, beginning with such unit fractions as $\frac{1}{2}$, $\frac{1}{4}$, and $\frac{1}{3}$, always at first in a concrete fashion, working through the other unit fractions as the multiplication table (with its converse) is studied, and completing the formal treatment in the fifth school year. (2) Common fractions are generally limited to those needed in daily life, the denominator rarely exceeding two figures. (3) No attention is any longer given in elementary schools to the reduction of difficult fractions to lower terms. (4) The subject of complex fractions (forms in which one or both terms are fractional) is usually omitted. (5) The power to operate with decimal fractions is gained from a study of decimal tables (the metric system in countries where this is used, and the monetary tables in most countries, except where the British units are employed) before the subject is taken up in any scientific way. (6) The study of decimal fractions, while thus being mingled with the study of common fractions and the training in the operations with integers, is taken up in a scientific way after the study of common fractions has been completed. This is in accord with the historical development of the two kinds of fraction and with the psychological difficulties to be encountered. (7) The operations are taught with only as much of theory as is essential to an understanding of the processes, and without requiring the pupils to memorize explanations. (8) The intimate relations between different forms of fractions, as in the identity $\frac{1}{2} = 0.5 = 50\%$, are emphasized, the pupil being encouraged to pass freely from one to another as conditions require. (9) The relation of the fraction to a ratio has occupied a good deal of attention of late, but it should be recognized that the concept of ratio is much more abstract than that of a fractional part of an object. (10) Three concepts of a fraction like $\frac{3}{4}$ are recognized in elementary teaching: (*a*) $\frac{3}{4}$ of a thing; (*b*) $\frac{3}{4}$ of a group; (*c*) $\frac{3}{4}$ as large, and the pupil is taught to use these several ideas in his problem work.

The details of explanation of the processes are sufficiently treated in the current textbooks, and the minor points of experiment are hardly of a nature to demand attention in this work. D. E. S.

FRANÇAISE ALLIANCE. — An association for encouraging the study of the French language in French colonies and foreign countries, with headquarters in Paris; founded in 1884 by Charles Tissot, Paul Bert, Paul Cambon, and Victor Duruy. It is essentially nonsectarian and nonpartisan, and seeks the coöperation of patriotic Frenchmen, diplomats, travelers, and missionaries. Its aims are: first, in French colonies and protectorates, to teach the French language in order to assimilate the natives; second, in countries still undeveloped to help teachers and Catholic or Protestant missionaries, by establishing and subsidizing schools in which French is taught; third, to establish relations with Frenchmen living in foreign countries, in order to preserve the cult of their national language. It recruits members and collects funds with which a large number of schools are subsidized in Turkey, Asia Minor, Syria, Egypt, and all over the world.

Alliance Française de New York. — A membership corporation organized in New York City in 1898, an outgrowth of the *Alliance Française* of Paris, and incorporated by special act of the Senate and Assembly of New York State on Mar. 22, 1907, with the particular object of encouraging in New York the study of the French language and of extending the knowledge of France, its literature, arts, history, and social life, and in general of developing social relations between the American and French people. The most important of the American groups of the *Alliance Française*, numbering 650 members in 1911, it provides for its members French lectures, entertainments, debates, dramatic performances. It established in 1902 the New York French Day Nursery, and entered into an agreement with Columbia University, offering every year two terms of free elementary courses for the study of the French language, for which 367 students registered during the academic year 1910–1911.

Federation of the French Alliance in the United States and Canada. — Incorporated in New York State in 1902; an outgrowth of the *Alliance Française de New York* and of local groups organized in other cities between 1898 and 1902. It aims to coördinate the efforts of the various groups, and to encourage the organization of similar groups in other cities. It has a circulating French library of 2200 volumes, and in 1911 represented forty-six different groups of the *Alliance Française* and twenty-six other affiliated societies. It selects for these groups prominent French lecturers and extends its coöperation to American universities. Headquarters: New York, 147 Fourth Avenue. D. J.

FRANCE, EDUCATION IN. — PRIMARY. — Primary education in France at the present time is in a thriving condition. There are, without including the large number of private schools, not less than 68,728 common schools, which are maintained by the State, and are attended by about 4,400,000 boys and girls. The law compels each commune, whatever the number of inhabitants, to have at least one school for boys, and if the population is at least 500, to maintain a school for girls. But through the long centuries of the past popular education was entirely neglected. The different monarchic powers which succeeded each other, Royalty or Empire, were not at all favorable to popular education. It required the establishment of a democratic and republican government to break with ancient traditions of neglect and indifference, and for the conviction to arise that a country with universal suffrage must also have universal education.

Historical. — In the Middle Ages no other education was provided for the people than the catechism. "Reading and writing were also taught," remarks an author naïvely. But that was all, and this advantage only fell to the good fortune of a small number of children who were received into the schools which existed under the different names, episcopal, cloistral, or parochial, according as they were established by the bishops, cloisters, or the churches of the parish. (See MIDDLE AGES, EDUCATION IN.)

In the sixteenth century a resolution was passed at the States General at Orleans in 1560, in the instructions of the nobility, for the education of the young of the poor. But this resolution, inspired by the Protestant Reformation, received no attention, and was not renewed. In the centuries which followed the nobles no longer thought of addressing a petition in favor of popular education, and Diderot (*q.v.*) said, "There is no doubt but that it is more difficult to oppress a peasant who can read than any other man." In the seventeenth century a Catholic priest, J. Baptiste de la Salle (*q.v.*), established the Institute of the Brethren of the Christian Schools (see CHRISTIAN BROTHERS), a teaching congregation which has rendered real service in a large number of schools down to the present day. But with its denominational character and mechanical methods the system could not adapt itself to the modern spirit, and like all the other congregations was suppressed by the law of July 7, 1904.

The Revolution of 1789 was marked by a large number of proposals, but there was neither the time nor the power of realizing them. Napoleon I established the University of France in 1806, but, occupied almost entirely with higher education, he paid no attention to primary schools. No provision was made for them in the Imperial Budget. The Restoration was no more generous, for it allowed only the ridiculous sum of 50,000 fr. for popular education as a mark of encouragement. This was the period of mutual instruction, introduced from England into France by imitators of Bell and Lancaster, but the transitory success of this method of instruction was at once proof of the lack of resourcefulness and the rarity of capable teachers. It spread everywhere for reasons of economy, since it allowed one teacher to instruct, with more or less success, even as many as four or five hundred pupils.

It was also under the monarchy that the law of June 28, 1833, known as the *Loi Guizot*, from the name of its author, at that time Minister of Education, organized elementary education for the first time. Henceforth there was to be a school in each commune, or at the very least one for a group of two or three communes. Another innovation of this law was the creation of a higher type of elementary education in the higher primary schools (*écoles primaires supérieures*), to be established in all the capitals of the departments and in communes of more than 6000 inhabitants. But on this point the law remained in part a dead letter, and the few higher primary schools which were established soon disappeared. The reactionary law of March 15, 1850, does not even mention their name. This is the *Loi Falloux*, which controlled public education throughout the Second Empire. It was enacted in a spirit of defiance to the wishes of lay teachers, and encouraged the development of denominational schools. The Church was at the time all-powerful, and no serious qualifications were demanded from teachers, provided they possessed ecclesiastical authorization, granted by the bishops and called *Lettre d'obédience*.

Present Conditions. — It is to the Third Republic that the honor belongs of having organized the system of elementary education. It succeeded in realizing what the leaders of the Revolution had only dreamed of. It established a system of national education very similar to that established by the democracy of the United States. It increased the number of schools, which were now established in the smallest villages. New and comfortable schoolhouses, which the malevolent call "scholastic palaces," were erected by the thousands. The right of the State to educate was vindicated, and teaching congregations were suppressed. While maintaining the freedom of instruction under certain conditions, elementary education was placed in the service of the State. Finally a system of universal education was established which was to be free, compulsory, and secular.

Ready consent was received for free education, established by the law of June 16, 1881. It was easily understood that the establishment of elementary schools, where a minimum of instruction should be given free to all the children of the nation, was a social obligation, and that free public schools ought to be open to all, rich and poor, and that arrangements made in preceding legislation, by which free education was only given to children of the destitute, should no longer be regarded as satisfactory. Besides, free education was the necessary corollary of compulsory attendance. But it was not without difficulty that the republican government succeeded in passing laws embodying the second principle. It required a strong minister like Jules Ferry (*q.v.*), who displayed remarkable energy, to secure a vote for compulsory education from Parliament (law of March 28, 1882). His efforts were seconded by an eminent educator, then Director of Elementary Education, M. Ferdinand Buisson. These two were the organizers, or, one might well say, the creators, of primary education in France. (See FEES.)

Secularization. — It was only gradually that the third characteristic of the French system, secularization, became a reality. In 1881 (law of June 16) the courses of study were secularized, and civic and moral instruction were substituted for religious education. In 1886 (law of Oct. 30) the teaching body was secularized by a provision that the public schools should no longer be intrusted, after a certain period, to clerical teachers and institutions. Finally a more recent law, July 7, 1904, continued the forward advance of the secular spirit by suppressing the teaching congregations, and closing as a consequence all the free schools directed by the congregations. The public schools are thus free, compulsory, and secular, but they are also neutral, in that the teachers must abstain when giving instruction from any word which would offend the consciences of the pupils and the belief of their parents. All incursions into the field of religion are forbidden. To each man his proper sphere; to the minister of religion the liberty of preaching the doctrine of the different churches, to teachers who teach in the name of the State, that is, of society, the right of limiting themselves to the field of universal human morals, together with the duty of refraining from any attack on religious beliefs. Neutrality is guaranteed by the secularization of the teaching body, and it must be strictly observed. The opponents of the lay schools — they are still numerous — claim that it is frequently violated; and this year the French bishops have denounced a number of textbooks as not conforming to the requirement of neutrality. They demand that these books be excluded from the schools. Hence there are some difficulties which have not yet been settled by the recent laws.

Duration of School Attendance. — The legal period of compulsory attendance at the elementary school is from six to thirteen years of age, but as a matter of fact a large number leave before this age. The compulsory period is somewhat short, and efforts are being made to lengthen it. A recent law has extended the age at which pupils will in future be allowed to present themselves for the *certificat d'études primaires* from eleven to twelve. From different sides the demand is being made that the school period should be raised to thirteen or fourteen. A desire is also expressed from another quarter that it might be possible to organize a regular compulsory system of education, similar to the continuation schools of Germany, where the adolescents may continue their studies after fourteen years.

Higher Primary Schools. — Beyond the elementary schools there is an extension through the *cours complémentaires*, *écoles primaires supérieures*, *écoles professionelles*, and *écoles manuelles d'apprentissage*. The *cours complémentaires* are classes added to the elementary schools. As their name indicates, they provide supplementary instruction to those pupils who are willing to remain at school after receiving the *certificat d'études*, a sufficiently diversified course, at once professional and general. In the majority of these courses some of the pupils prepare for the *brevet élémentaire* and the normal schools.

The higher primary schools are special institutions, located apart from the elementary schools and under a different director. They provide at least two, most generally three, years of study; the latter are said to be *de plein exercice.* To be admitted to these schools, as well as to the *cours complémentaires*, pupils must have the *certificat d'études primaires élémentaires*, and must have taken for one year the *cours supérieur* of a primary school. The curriculum of the higher primary schools continues and develops that of the primary school. In the most important of them special sections are established for agriculture, industry, commerce, and domestic occupations. The course of study, which was modified in 1909 to receive a more practical and professional character, includes, in addition to a fuller development of the elementary curriculum, the reading of literary works, common legal ideas, political economy, algebra, geometry, common rules of bookkeeping and accounts, and for boys the work of the shop, laboratories, agriculture, and horticulture, for girls the care of children from their earliest age, and domestic arts. A committee of patronage is established over each school. The pupils who leave the higher primary schools enter on very diverse careers. Of the boys, according to official statistics, about 30 per cent enter industry, commerce, or agriculture, 15 per cent become employés in offices or stores, 8 per cent proceed to normal schools. Of the girls 17 per cent enter the normal schools, 6 per cent become workers or apprentices in clothes and dress factories, 4 per cent take employment in offices or stores.

Courses for Adults. — To complete the education of children who leave the primary schools at twelve or thirteen, and who cannot enter a professional or higher primary school, either through failure in examinations or because poverty in their homes compels them to enter on some employment as quickly as possible, evening classes, called *cours d'adultes ou d'apprentis* have been established. These courses are established in the same way as primary schools, that is, by the prefects at the request of the municipal council of the commune and on the advice of the Inspector of the Academy, and are placed under the control of the State, and may receive a state subvention on condition that the commune undertakes the cost of heating and lighting. They are usually under the direction of teachers, male or female, and every year a certain sum is inserted in the budget for their remuneration. These courses supplement the primary education, and in addition provide, according to the needs and means of the commune, more specialized instruction adapted to the industries or agriculture of the district. The pupils who pursue these courses, only open to those above fifteen years of age, and who have not obtained the *certificat d'études primaires*, may present themselves for an examination specially instituted for them, the *certificat d'étude des adultes*, which is evidence that they have successfully pursued the evening course. In 1910 there were 229 public higher primary schools for boys and 135 for girls, attended by 26,649 boys and 18,259 girls.

Besides the higher primary schools, where the instruction retains the character of general culture, there are some schools which prepare definitely for the vocations. Such are, first, the practical schools of agriculture, which may be entered at thirteen years of age after an examination. Tuition fees are charged. There are also manual apprenticeship schools and professional higher primary schools, which are regulated by decrees of Mar. 17 and July 28, 1888. They are under the direction of the Minister of Public Instruction and of the Minister of Commerce. The maintenance of these schools falls on the departments and communes, but the salaries of the staff are paid by the State. The pupils must be twelve years of age, and must have the *certificat d'études primaires*. The course lasts three years, and instruction is free. To this list must be added the five following schools established in Paris, which are of great importance both in the quality of the instruction given and in the number of pupils. (1) *L'École Diderot*, where metal and woodwork are taught, (2) *L'École Boulle*, arts and furniture, (3) *L'École Estienne*, arts and book industries, (4) *L'École Germain Pîloy*, practical design, (5) *L'École Bernard-Palissy*, design and application of fine arts to industry. These schools are under the control of the Minister of Commerce. (See further INDUSTRIAL EDUCATION.)

Écoles Maternelles. — This is the name adopted in France to designate the Kindergarten, because the care there given to children recalls so far as possible the care given by a mother. These schools receive the children from the ages of two to six years, that is, up to the age when they are received into the primary schools. There should also be mentioned the existence of *classes enfantines*, which to some extent are intermediate between the *écoles maternelles* and the primary schools. They are attached either to an *école maternelle*, or to a primary school. "They are," according to the organizing decree of Jan. 18, 1887, "institutions for the earliest education, where children of both sexes receive in common the care which bears on their physical, moral, and intellectual development." Properly speaking, they are not schools, but the children are there prepared to pursue a school course. The program consists of games and songs, manual exercises, the first principles of moral education, the more common information, language exercises, the first elements of design, reading, writing, and number work. There are at present 2613 lay *écoles maternelles*, and 1498 private schools besides. The teaching staff is exclusively female. The directresses must have the *certificat d'aptitude pédagogique*. Supervision is exercised by the ordinary inspectors, sometimes, but rather rarely, by some departmental inspectresses, and by the general inspectresses of *écoles maternelles*.

Mixed Schools. — It is well known that coeducation, which prevails to such an extent in the United States, has not entered into the French system. Still there are a few schools where boys and girls are together, under the direction of a male or female teacher. These are called mixed schools. There are more than 20,000 of these, with 718,873 pupils, or 718,880, if Algiers is included.

Internal Organization of the Schools. — Six hours of class work are given, from 8.30 to 11.30 and from 1.00 to 4.00, every day except Sunday, which is a day of rest, and Thursday, which is left free to permit the attendance of pupils at religious instruction outside the school. In addition, there are several holidays during the year, on religious festivals, New Year's Day, and on July 14, the national holiday. The long vacations last for six weeks, from the 15th or the 20th of August to the end of September or the beginning of October. Two weeks extra are given in these schools in which the teachers have organized courses for adults and consequently have done full duty for the year. The long vacations also extend over two months, except in a certain number of schools which have established vacation courses and give one hour's instruction each day for a month. The periods are divided by recesses of a quarter of an hour, one in the morning and one in the afternoon. Pupils who cannot go home for their midday meal find in a large number of schools *cantines scolaires*, which provide lunch free or at a very modest price of ten, fifteen, or twenty centimes (two, three, or four cents). In the afternoons pupils may be authorized to remain at school to do their home work and to learn their lessons under the supervision of a teacher; this is called supervised instruction (*études surveillées*), which is given in some cases gratis, in some not.

The curriculum is divided into three grades, *cours élémentaire*, for pupils between six and nine years, *cours moyen*, for pupils between nine and eleven, and the *cours supérieur*, for pupils between eleven and thirteen. In the schools with a large enrollment each *cours* constitutes a distinct class under a separate teacher, and sometimes, when the numbers are very big, there are two parallel classes of equal standing, each under a teacher. There are also schools with a very large number of classes, up to ten, twelve, or fourteen. Each class must have at least fifty pupils.

Schools which have many classes, and consequently many teachers, have a director at their head. The directors are selected from among those teachers who have served a certain number of years and have distinguished themselves by their excellence. They receive an additional salary, which varies from 200 frs. in schools with three classes, to 400 frs. in schools with four classes. In those schools which have six classes and 300 pupils, the directors no longer give instruction; they are freed from class duty and devote themselves entirely to the material and moral direction of their schools.

Curriculum. — This includes those elements of knowledge which are taught in nearly all the states of America and Europe, omitting, of course, religion. This instruction is more markedly theoretical than practical. "Its object," said Gréard, the true organizer of the school system of Paris, "is not to include under all the branches with which it deals all that can possibly be known, but to learn in each of them that which cannot be ignored." Active, intuitive methods are employed for developing the senses and intelligence of the children. At a recent conference some teachers showed an inclination to give a more practical, more vocational, stamp to primary instruction. But their proposal was not accepted, and the large majority of their colleagues remain attached to an educative instruction in general culture to mold the man and the citizen.

Operation of the Compulsory Attendance Law. — To insure the execution of the compulsory attendance law, two methods, *commission scolaire* and the *caisse d'école*, were established by the parliament of 1882. Children who do not attend regularly must be reported by their teachers to the *commission scolaire;* the parents, who are held civilly responsible, are condemned to penalties which in case of a repetition of the offense are public posting of their names, fines, or even imprisonment. Unfortunately these boards have not yet done their duty, and their inactivity explains the fact that there is still in France too large a number of illiterates. More than 10,000 conscripts enter the army each year without being able to read or write. There is a proposal to alter the composition of the boards, which at present is too exclusively municipal and local. Reference may here be made to the recent establishment of *écoles de perfectionnement* for backward or abnormal children (law of April 15, 1909).

The *caisses d'école* are intended to assist the children of poor families by providing them free with books and paper which they cannot buy, and also by occasionally distributing clothing. Under certain circumstances these boards may be subsidized by the State.

Certificates and licenses. — The diplomas expected from the teacher are the qualifying certificates, *brevet élémentaire* and *brevet supérieur*, the examinations for which are regulated by the decree of Jan. 10, 1887, and Aug. 4, 1905. Further there are (1) the *certificat d'aptitude pédagogique*, the necessary requirement for permanent appointment, and various certificates of professional ability; (2) *certificat d'aptitude au professorat* in normal and higher primary schools; (3) certificates for inspection of primary schools, the direction of normal schools, and inspection of *écoles maternelles.* There are, besides, other certificates for special subjects, — modern languages, bookkeeping, manual instruction, and dancing.

For the pupils there are two certificates: (1) the *certificat d'études élémentaires*, which is, as it were, the graduation in elementary studies; the examination for the certificate may be taken at the age of eleven, but a recent law has postponed the age to twelve. About 10 per cent of the pupils ask for and obtain the certificate at this age. (2) *Certificat d'étude primaire supérieure*, which is awarded on a written, oral, and practical examination covering the whole course.

Inspection of Schools. — The inspection of schools is conducted primarily by the heads of the institutions who supervise the work of the teachers and pupils, and secondly by special officials who bear the name of inspectors. Of these there are, first, the inspectors of primary education, at least one to each district (*arrondissement*), three or four to each department, and 454 in all. They are nominated by the Minister, and must possess a special diploma, the *certificat d'aptitude à l'inspection des écoles primaires et la direction des écoles normales*, obtained by competitive examination, for which teachers, male and female, at least twenty-five years of age, with five years of service and holding the *certificat d'aptitude au professorat des écoles normales, or* a license to teach in secondary schools, are eligible. Teachers who hold only the *brevet supérieur* and the *certificat d'aptitude pédagogique*, if they have served ten years, are also admitted. The primary inspectors must visit the schools of their circumscription each year. After each visit they must inform their subordinates in a written bulletin in what points their work was satisfactory or in what it was inefficient. In addition to the duties of inspection, the inspectors are charged with administrative functions ; they advise on the appointment and promotion of teachers, on the erection and construction of schools, etc.

Over the primary inspectors are the inspectors of academies, who are really the heads of departments for primary education. These officials, who also play an important part in secondary education, appoint the *stagiaires*, propose the names of *titulaires*, male and female, to the prefect, receive the reports made to them by the primary inspectors after each inspection, and preside at the administrative councils of normal schools, etc. Finally, the general inspectors of primary education, to the number of ten, supervise the whole system of instruction. They are sent annually on a mission to the schools of Paris and of the departments. There are also general inspectors of accounts, of design, and of gymnastics.

The powers of the rectors are various. Their authority extends over the three fields of education, but so far as primary education is concerned is very limited, since they do not take part in the appointment of the teachers, which devolves on the prefects and the inspectors of the academies, and is only exercised by the rector of Algiers. It would be logical that this practice should be followed in all the academies, and that the appointment of teachers should be made by the university heads, and not by a political official, like the Prefect of the department. This reform has been projected several times, but up to the present without success.

Departmental Council. — There is, further, in each department, a departmental council, presided over by the prefect and consisting of general councillors, of teachers, and inspectors. This council appoints the cantonal delegates representing families, as well as the teachers, specially charged with the examination of the condition of premises, equipment, health, and conduct of the pupils. They determine the number, nature, and location of public primary schools, the number of teachers employed therein, and supervise the carrying out of the curriculum. This is one of the most important organizations in the administration of French elementary education. It is still charged with the duty of advising on certain disciplinary penalties imposed on teachers (temporary or permanent suspension), and of deciding others (censure, revocation). The teachers may appeal against these penalties before the *Conseil supérieur de l'instruction publique.*

Normal Schools. — The professional preparation of teachers is secured in the normal schools. There should, according to the general principle, be one normal school for boys and one for girls in each department. But recently, through reasons of economy, two contiguous departments have been authorized to make agreements to unite for the establishment of a normal school. Hence there are only eighty-five normal schools for male teachers and eighty-four for women teachers. The students are admitted by a competitive examination, and remain for three years. With two exceptions (Ajaccio and Maçon) these schools, which are free, are boarding schools (*internat*). The students must hold the *brevet élémentaire* before presenting themselves for the examination. At the end of the second year they take the examination for the *brevet supérieur;* and during the third year, which is more strictly professional, they receive their direct practical training in school instruction in the practice schools (*écoles annexes*) attached to the institutions. Here they give the instruction by turns under the direction of their teacher.

Each normal school has at its head a director, man or woman, assisted by a bursar and an administrative council. The professors of letters and of science number 378 in the normal schools for men, and 364 in those for women. They are appointed by the Minister after a competitive examination, to which only teachers twenty-one years of age, and holding the *brevet supérieur*, and with two years of service, are admitted, and as a result of which the *certificat d'aptitude au professorat des écoles normales* is given. To facilitate the preparation for this examination there are two primary higher normal schools, at St. Cloud for men, and at Fontenay aux Roses for women. They are, like the normal schools, free, and entrance is regulated by competitive examination. The students must be from nineteen to twenty-five years of age, must have the *brevet supérieur*, and bind themselves to serve for ten years in a public school, an obligation into which candidates for the normal schools must also enter.

Appointment of Teachers. — On leaving the normal schools the graduates are appointed by the inspector of the academy as temporary teachers (*stagiaires*), and serve for a period of at least two years in one school, at the end of which they are allowed to present themselves for an examination on passing which they are awarded the *certificat d'aptitude pédagogique*, and which includes a written, oral, and practical test. The last consists of class lessons given to pupils in the presence of the examining commission. When they have obtained this certificate, which is evidence of their professional ability, the *stagiaires* are appointed permanently under the name of *titulaires* by the prefect on the recommendation of the inspector of the academy.

The normal school pupils and the pupil teachers number more than 10,000. In 1907, after the three years of study, 1616 men left the normal schools, and 1675 women. This annual training of more than 3000 students does not always suffice to fill the vacancies. A call is therefore made on those candidates who hold the *brevet supérieur.*

Disciplinary Penalties. — A graduated system of penalties for teachers in primary schools was established by the law of Oct. 30, 1886. The penalties and the authorities who impose them are, (1) reprimand by the inspector of the academy, (2) censure by the inspector of the academy on the advice of the departmental council, (3) dismissal by the prefect on the recommendation of the inspector acting on the advice of the same council, (4) temporary suspension, and (5) permanent debarment by the council, from which the offender may appeal to the Superior Council of Public Instruction.

Administrative Authorities. — The supreme head of the system is the Minister of Public Instruction, who is assisted immediately by three directors, one for each of the three branches of education, primary, secondary, and higher. There is further a fourth director of accounts, charged with the administration of the expenditure of the department. Each director is at the head of several bureaus, each with special functions.

Below the Minister come the rectors, who are charged with the administration, in his name and under his order, of the seventeen educational divisions of France, called academies. In the Academy of Paris there is only a vice-rector, the title, if not the duties, of rector belonging to the Minister himself. The sixteen other academies are Aix, Besançon, Bordeaux, Caen, Chambéry, Clermont-Ferrand, Dijon, Grenoble, Lille, Lyons, Montpellier, Nancy, Poitiers, Rennes, Toulouse, and Algiers.

Cost of Primary Education. — The budget for primary education is large. (See COST OF EDUCATION. As explained under this topic an accurate comparative statement of the cost of education in various countries is not possible.) The details of the sums included in the budget for 1910 are as follows: —

Salaries (not including towns with more than 150,000 inhabitants)	177,193,800 francs.
Contributed by the State to towns of over 150,000 population .	5,000,000 francs.
Higher primary education .	4,878,246 francs.
Normal schools, salaries . .	4,300,235 francs.
Normal schools, equipment .	4,866,000 francs.
Higher primary normal schools .	325,600 francs.
Inspection	2,466,350 francs.
General inspection . . .	130,000 francs.
Bursaries (for traveling and foreign visits)	800,000 francs.
Expenses of substitutes and sick pay	1,043,200 francs.

This gives a total of expenditure amounting close to 200,000,000 frs. To this must be added the expenses of the communes, first those with a population over 150,000, which contribute a large share toward the salaries of teachers, and then all the communes, which must pay compensation for rent and lodgings. Further an annual credit is inscribed in the budget for the creation of schools and posts. The State has spent enormous sums on this for the last thirty years, and in 1910 set aside, 680,000 francs.

Salaries. — The claim has frequently been made that women teachers be paid equal salaries with men, on the principle of "equal work, equal qualifications, equal pay." But this principle does not yet prevail in the legislation of France, and the women are paid less than the men, at any rate in the third, second, and first classes.

CLASS	MEN	WOMEN
	frs.	*frs.*
Stagiaires	1100	1100
Titulaires		
Fifth	1200	1200
Fourth	1500	1400
Third	1800	1600
Second	2000	1800
First	2200	2000

To the fixed salaries are added compensation for rent in the communes which are the capitals of cantons, or where the population is above 1000. This compensation varies with the population; in districts of 1000 inhabitants it is 100 frs., and rises to 800 frs. in very large towns, and to 2000 frs. in Paris.

Pensions. — Teachers have a right to a retiring pension at the age of fifty-five, and after twenty-five years of service. But a large number, if they are still in good health, continue in their duties beyond this. The law of Aug. 17, 1876, which regulated the matter, fixed the amount of the pension at not less than 600 frs. for men and 500 frs. for women.

Auxiliary Institutions. — To present an almost complete idea of the system of primary education it would be necessary to mention various institutions auxiliary to the school. (1) *Conférence pédagogique*, a periodical assembly to which the *titulaires* are summoned to discuss educational questions, and to draw up a list of school textbooks. (2) *Libraries* of three types: (*a*) pedagogical for use of teachers, one in each cantonal capital, (*b*) for pupils, one in each school, and (*c*) public, for the parents as well as the children. (3) *School savings banks*, which aim at instilling in the pupils early habits of order and thrift. (4) *Musée pédagogique*, located in Paris and containing school equipment, teaching apparatus, and a good library, which is open to readers in Paris, and also circulates its books and lantern slides in the provinces, sending them free on request. There is further at the Museum a Bureau of Public Education. (See MUSEUMS.)

Private Education. — Before the law of 1904, which suppressed the teaching orders, the number of private schools under the congregations had risen to 6157: 1288 schools for boys under the Christian Brothers, and 4869 schools for girls under Sisters of different orders. These schools were gradually closed by the operation of the law of July 17, 1902. Several schools still continue; there were, on June 1, 1909, fifty-six schools of the Christian Brothers and 833 schools of Sisters. Further, a large number of the closed schools have been reopened with a lay or secular staff; the members of the orders having exchanged their ecclesiastical garb for civilian mufti. On June 1, 1909, there were 3069 reopened as private lay primary schools, 992 for boys and 2077 for girls. The private schools are established and maintained by individuals or by associations. The State leaves them free in respect to curriculum and method, but the same qualifications as to age and ability are demanded from their teachers as from public school teachers. The formalities for opening a private school consist of a declaration made to the mayor of the commune indicating where the school is to be established.

SECONDARY EDUCATION. — **Historical.** — Secondary education was officially established by the law of May 11, 1806 (confirmed by decree of Mar. 17, 1808), by which the University of France was founded, as an instructing corporation, standing alone and dependent on the State. Until that time education had remained almost entirely a matter for the Church. The universities themselves, which in their faculties of arts gave an education equivalent to the secondary, were dependent on the ecclesiastical authority. But above all the religious corporations, and in particular the Society of Jesus, established in 1540, monopolized education. In the seventeenth and eighteenth centuries the colleges of the Jesuits flourished above all others, and retained that position until they were closed in 1764, when the Jesuits were expelled from the kingdom. Another religious corporation, the Oratorians, took their place to some extent, and for a time were successful. But the Revolution broke out and suppressed the universities and the congregations. To replace the colleges there were established central schools, composite institutions, which combined industrial arts and literary studies and met with but moderate success. They disappeared after a few years, being abolished by the law of May 1, 1802. It was then that Napoleon created out of all the sections the University of France, which, with some special faculties of higher education, united the lycées and colleges of secondary instruction. The University of France still exists, at least in name; and it is to be regretted that there is but one word to denote, on the one side all the scholastic institutions, and on the other the institutions for higher learning, recently reconstituted under the title of university — but how changed and different from what it was originally! Napoleon had invested it with a monopoly in education, and it alone was charged with the provision of national education, while now this monopoly no longer exists, and the freedom of instruction has been legally established; and although the monopoly of the university is demanded in some quarters, there is reason to believe that freedom will be maintained because it conforms to republican principles. Further, the curricula of secondary education have been considerable modified. Under the pressure of the modern spirit there has been a failure to retain certain studies, while others, notably modern languages, have been introduced; there has been a discontent with the classical studies and the old humanities, and an adaptation of the curriculum to modern needs of society. Hence a lycée of 1910 bears little resemblance to a lycée of 1810, where almost nothing but Latin and mathematics were taught.

After the fall of the First Empire, the imperial lycées became the royal colleges. Again becoming lycées under the Republic of 1848 and the Second Empire, there was no palpable change in their character. It may be recalled only that for a time the studies were divided into two sections — letters and science; this is known as the period of bifurcation. And this arrangement was further divided under the Third Republic, and modern instruction, without Latin or Greek, was distinguished from the classical, a system already in operation under the Second Empire, when special instruction was established.

Present Conditions. — The system of secondary education was regulated anew by the decree of May 31, 1902, which was inspired by the report based on a parliamentary inquiry, organized in 1899 and presided over by M. Alexander Ribot, the Prime Minister. In the course of the inquiry the most competent educators in the country were consulted. The system has now been in force eight years, and, while objections and criticisms have been raised, it is generally accepted, and it seems that it will stand, although past experience shows that in such matters there is nothing final. Secondary education has been frequently altered during the last century without ever receiving a lasting character; so that it would not be cause for surprise, if within a few years new changes were proposed and accepted. There is no need to disguise the fact, for of the three branches of education the secondary has been the most discussed in France. Elementary education may be left out of consideration, for it depends on the needs of a democracy. Higher education does not meet with opposition. But intermediate education, which is the education of a class, since it is provided almost entirely for children of the middle class, is sometimes questioned. Its utility is not always recognized. It is not borne in mind that it is indispensable for the intellectual training of the nation, that before the period of specialization the youth of the country must pass through a stage of general culture, that even in a democracy, jealous of the rights of equality, it is not possible to give a thorough education to all, that a broader and more complete education must be reserved for a few; and, finally, that to train an intellectual élite there are required time, long study, and better prepared and better educated professors than are the teachers of the elementary school. These reasons will undoubtedly triumph over the prejudices of the masses, who in their ambitions are sometimes inclined too much to be levelers. Secondary education will be maintained, not gratuitously, it is true, like elementary, for it is just that those who are rich should pay, and will be made more and more accessible to the able but less fortunate children by means of scholarships which the State grants with a liberality which is always great.

Course of Study of 1902. — The following are the main characteristics of the course of study of 1902. The most striking feature is that, in place of the one single and uniform course for all pupils, several are provided for their selection. Here is obvious the influence of the elective courses common in the United States, whose existence and success were noticed by the present writer in the *Report on American Secondary Education,* presented after his return from the World Exposition at Chicago to the Minister of Public Instruction in France in 1893. The courses last seven years.. Pupils are received at the age of ten or eleven, and remain to seventeen or eighteen, the age of graduation. The school period is divided into two cycles, one of four and the other of three years. In the first cycle, sixth, fifth, fourth, and third forms, the pupils have a choice of two sections. In the one, called Section A, are taught Latin, compulsory from the first year (sixth form), Greek, optional from the third year (fourth form), as well as subjects common to both sections: French, modern languages (English or German), arithmetic and mathematics, natural sciences, history, geography, and drawing. The second section, called Section B, differs from the first in not including Latin or Greek, and in paying more attention to French (five hours instead of three), and to the sciences. In both sections in the fourth and third forms elementary moral instruction is given for one hour a week in the form of lectures and discussions on individual and social duties.

The system of electives, or *quadrifurcation,* is offered in the second cycle in the second and third forms. The four groups are (1) Section A, in which, besides the studies common to all, Greek and Latin are studied (Græco-Latin section); (2) Section B (Latin-modern-language section) has three hours of Latin as before, and seven of modern languages (English or German), of which three are given to the language already studied in the first cycle, and the four to the other; (3) Section C (Latin-scientific section), in which the sciences predominate, five hours being given to mathematics, three to physics and chemistry, and three to Latin; (4) Section D (Scientific-modern-language section), in which Latin disappears altogether, the section being exclusively modern and French, with five hours for mathematics, three for physics and chemistry, two for practical scientific work, and seven hours for modern languages. This section is gradually replacing what was known as special and modern instruction.

Such is the course of studies, flexible and varied, in the second and first (formerly the rhetorical) forms. There remains one year, the seventh, in which the pupils divide into two forms, the philosophical and mathematical. In the philosophical are taught mainly philosophy, history, mathematics, physical and natural sciences, while Greek, Latin, and modern languages are optional. The mathematical form retains the study of modern languages and a little history, while the greater part of the time (seventeen hours) is devoted to the sciences.

This is the normal organization of the courses; but it must be mentioned that in the important lycées there are also special classes preparing for the great schools like the military school at St. Cyr, the Polytechnic, and the *École Centrale.* Further, in a certain number of lycées there has been established a fifth section with a shorter course of study (three or four years), based on modern languages and sciences, which are taught throughout with a view to their practical application. This system has certain points of resemblance with the German *Realschule,* where pupils are prepared for a practical career, industrial or commercial. Finally, in all the lycées and colleges there are elementary and primary classes (seventh, eighth, ninth, tenth, and *classe enfantine*). Elementary studies are the necessary basis of all secondary instruction, and can be acquired in the schools as well as in the lycées or colleges. A large number of pupils, therefore, do not enter the lycée or college until the sixth class, the first year of secondary studies, that is, on leaving the primary schools.

The Baccalaureate. — The degree of bachelor forms the natural culmination of secondary education; it is the reward which crowns the studies. The baccalaureate has been frequently attacked; press campaigns have been conducted for its suppression, but it resists all attack. It is the necessary passport for entering on higher study. How else than by final examination is it possible to know whether a student has profited in his secondary studies and is fit to pursue a course at the university? Attempts have, indeed, been made to ameliorate the conditions under which the examination is taken and to correct certain defects about which there have been complaints. These dealt first with the enormous task imposed by the examination on the professors of the faculties of letters and sciences, who until recently were alone charged with the duty of examining, and who were diverted from their proper function of giving higher instruction and engaging in private research. France is a remarkable country, said a German educator; they use razors of the finest edge to cut stones! The professors of the faculties, who are here referred to, certainly take part always in the baccalaureate examinations; but though they preside at them, they are partly freed from this ungrateful task by the assistance of a board of professors of the lycées who are the most competent to appreciate the results of secondary education. They are placed on the boards of examiners, provided that they are *agrégés*, or doctors, and also, to insure impartiality, on condition that they do not question the pupils of those schools where they themselves are teaching. Another objection raised against the examination is the luck, the chances in an examination which lasts but three quarters of an hour, and in which outside examiners, the professors of the faculties, are called in to decide on pupils whom they do not know. To remedy this defect there have been introduced report books (*livres scolaires*) in which the professors of the different classes note down in advance, year by year, the marks gained by their pupils, and the boards of examiners must make themselves acquainted with these books before deciding on the admission or postponement of candidates.

The division of studies into several sections has as a consequence the division of the examinations for the baccalaureate. There are two distinct parts, which the candidates pass successively at an interval of a year; the first part comes on leaving the first form, the second at the end of the philosophy or mathematical forms. In the first part there are four series of examinations, corresponding to the four sections. The candidates of sections A, B, and C have a written test, including a French composition and a Latin translation; those of A have in addition a Greek translation, those of B a composition in a foreign language, and those of C exercises in mathematics and physics. Candidates from section D also have three exercises, French, a foreign language, and science. The written tests are merely qualifying examinations. Those candidates who are successful are declared to be admissible, but are not admitted until they have passed the oral tests, which consist of suitable questions on the subjects studied in the different sections.

The second part of the baccalaureate, which must be successfully passed to become a complete bachelor, is based on the studies of the classes of philosophy or mathematics. There are thus two distinct examinations: (1) the baccalaureate of philosophy, the examination for which consists, for the written test, of a dissertation on a philosophical subject and a composition on the physical and natural sciences; (2) the baccalaureate of mathematics, with a mathematical test, exercises in science, and a composition in philosophy.

The boards of examination meet twice a year and hold their sessions one at the end and one at the beginning of the scholastic year, that is to say, in July or August, and October or November. Candidates for the first part of the examination must be sixteen years of age, but exceptions are made by the Minister when candidates seem to be likely to succeed, even though they have not reached the required age. The number of bachelors created each year is considerable. The following are the results of the session of July, 1910: —

	Number of Candidates	Rejected after Written Test	Passed Finally	Passed Per Cent
First part:				
Latin-Greek . .	2334	934	1092	47
Latin-modern-languages . .	3251	1536	1344	41
Latin-science .	2777	1222	1318	48
Science-modern-languages . .	4299	2278	1648	38
Second part:				
Philosophy . .	5745	2004	3045	53
Mathematics .	3355	1057	1923	58

Candidates who are put back at the July session present themselves again in October; those who have passed one part may retain credit for one year, and need not take the written test again. In October, 1909, there were 5052 candidates, of whom 2546 were admitted to the first part, and 3367 candidates, of whom 2214 were admitted to the second part. This makes a total for 1909 in both sessions of 6036 bachelors. It may be noted that the number of candidates who are put back is very large, often more than half; that the results are better for the second part than for the first; that the number of candidates is much larger in section D than in any other. It is obvious that the baccalaureate is much sought after in France, for it opens the door not only to the universities, but to all careers. In spite of the diversity of the examinations which are conducted, there is only one baccalaureate of secondary education, and graduation in philosophy or mathematics confers the same privileges. The baccalaureate in law is gained after one year of study in the faculty of law.

Other Degrees. — Above the degree of baccalaureate come the *licence*, which is sought by future professors, then the doctorate and the *agrégation* (*q.v.*), which is a professional examination. There are several licentiates: (1) four licentiates of letters corresponding to the four kinds of study — philosophy, history, classical languages and literature, and modern languages. (2) Licentiate in science, which is conferred without any further examination on all students who possess these certificates of higher studies in mathematics and physical and natural sciences. (3) Licentiate in law, obtained in the faculty of law after three years of study. The different licentiates are conferred by the faculties of letters, sciences, and law. The statute on licentiates in science was regulated by decree of Jan. 22, 1896, that for letters by decree of July 5, 1907. The doctorate in letters and the doctorate in science can only be conferred on those holding the licentiates. To obtain the doctorate two theses, which are often works of importance, must be presented and defended publicly before a faculty. The third degree is only sought by candidates who look to higher education; from 1810 to 1910, a century, not more than 1333 doctorates were granted by the faculty of letters, and less in the faculty of science. *Agrégation* is not a degree, but a title required for appointment as professor in a lycée. A competitive examination takes place each year before special boards of examiners, and only candidates holding the licentiates are allowed to present themselves. There are several kinds of *agrégation* — philosophy, history, letters, grammar, English, German, Spanish, Italian, mathematics, and physical and natural sciences. (See AGRÉGATION.)

Lycées for Boys. — Lycées for boys at present number 108. They are nearly all located in capitals of departments, a few in capitals of specially important *arrondissements.* The number of pupils in attendance in 1909 was about 60,548; in 1875 there were 38,000, and 54,830 in 1901. There is thus a considerable increase. The dispersion of the congregations, the suppression of the colleges of the Jesuits, Dominicans, and Oratorians brought back to the state schools a part of their clientèle. But only a part, for a number of free colleges were reopened under the protection of the bishops or civil societies, and gathered in the heritage of the congregations. The number of pupils who attend these schools may be estimated to be about 50,000.

It is to be noted that while the total number of pupils in the lycées has increased, the number of intern pupils has diminished. In 1885 there were 25,000, while in 1908 there were not more than 17,000. The *internat* is clearly on the decrease, at any rate in the establishments of the State. But there is no need to complain or to regret the time when there were seen crowded together in certain lycées of Paris as many as seven or eight hundred intern pupils. It is to the advantage of families, when they can do it, to retain their children in their midst.

Colleges. — The number of pupils who attend the colleges has not varied within the last thirty years: 35,438 in 1875, 36,282 in 1908. Here, too, the intern system has declined: 14,671 intern pupils in 1875, 12,854 in 1908. The colleges differ from the lycées in the first place because they are maintained by the State and by the municipalities; secondly, the colleges are communal, the lycées are national; their importance is less, and their professors do not hold the same degrees.

Administration of Lycées and Colleges. — Each lycée is directed by a *proviseur*, or headmaster, who is expected to act as the senior of the institution by the constant supervision exercised by him, by his advice to the professors, by the remarks which he makes to the pupils. He is assisted by a *censeur*, who is more especially charged with the supervision of discipline and the good progress of the studies. Other assistants are the *économe*, or bursar, on whom falls the financial management; one or more *surveillants généraux* or general supervisors; several *répétiteurs* (tutors), who supervise the study periods and of whom a few take part in instruction, with the title of adjunct professors. All these officers are nominated by the Minister. For the material surveillance of the boarding establishment and the dormitory, with which the tutors were formerly charged, there have recently been created *surveillants d'internat*, who are selected by the headmaster from a number of young men, generally graduates, who wish to continue their studies. Finally, the *proviseur* is assisted by an administrative council, consisting of men of prominence, members of the alumni associations, local authorities, the rector, the prefect, the mayor, and a professor of the lycée.

Teachers in Lycées and Colleges. — To obtain a permanent appointment in a lycée, candidates must have the title of *agrégé*, in a college the degree of licentiate or bachelor; but the instructing staff in a lycée must include some *agrégés*, and in a college some licentiates. In the lycée there are 1820 *professeurs agrégés*, and 723 licentiates who do not bear the title of professor, but are merely acting teachers. But some recent regulations have permitted a certain number of acting teachers to enjoy the title and pay of professors. In the colleges the staff is divided into three classes, professors of the first rank, holding the licentiate and numbering 1625 in 1908; professors of the second rank, who are only bachelors, to the number of 613; professors of the third rank, to the number of 299, who do not hold the bachelor's degree, and only have the *brevet de l'enseignement primaire.*

Training of Teachers. — The training ground of professors of the lycée has been throughout the nineteenth century the Higher Normal School in the Rue d'Ulm. Since the establishment of the universities, this school has ceased to enjoy an independent existence; it has continued to the present, but only as part of the University of Paris, whose students attend courses at the school. In addition, a certain number of scholarships are awarded after competition to candidates for the degrees of licentiate and *agrégé* and divided between the universities of Paris and the provinces.

Inspection of the Lycées and Colleges. — This duty is exercised by the rector, the inspector of the academy, and general inspectors, of whom there are sixteen, four for science, four for letters, two for history, three for modern languages, one for philosophy, and two for the inspection of accounts (*économat*). They visit the different institutions each year, and send a report to the Minister on each officer inspected, on the condition of each institution. They meet in Paris, where sits the consultative committee (section for secondary education) of which they are members, and this body recommends to the Minister the appointments, dismissals, and promotions which appear desirable in the teaching body. Once each year the rectors are invited to take part in the work of the consultative committee, especially to arrange the list of teachers who are to be promoted, that is, who are to receive an increase of salary. The teachers are divided into several classes with different salaries, and promotions take place in a strictly definite order, some by seniority, some by selection.

The Curriculum. — The courses of study have been fixed for each form by the decree of May 31, 1902. It may justly be said that every branch of human knowledge is there represented, to insure general intellectual culture. The decree mentioned above also determines the weekly division of subject matter. The length of each period is usually one hour. In the higher forms of philosophy and mathematics, with the older boys whose attention is more sustained, the length of a lesson may be two hours, broken by a short recess.

As distinguished from primary education, secondary education includes religious instruction for those who desire it in the lycées. The services of the Roman Catholic Church are celebrated in the chapels of the lycées. Religious instruction is given by the chaplains, abbés, pastors, or rabbis. But the whole question of religious instruction is under discussion and in a state of transition. Within the last year, an addition has been made in certain lycées to the intellectual education by the introduction of manual training and the establishment of workshops in iron and wood.

Method. — Methods are perhaps of greater importance than the curriculum. Considerable pains have been taken to improve them. Precise and detailed instructions have been included in the course of study of 1902, which point out the method to be followed in each subject. Only the most important points will be indicated here. French, which of course is studied in every form, except the philosophical and mathematical, is to consist of explanatory reading of authors by means of and with reference to the texts which are used in teaching history of French literature. In all the classes French compositions are set, in the form of descriptions, narratives, letters, and, later, dissertations. The chief aim of modern language instruction is to secure the thorough acquisition of the language studied, the ability to write and speak English or German. In the lycées which are near Spain or Italy, Spanish or Italian is taught as the second modern language. The direct method, which insists on use, rather than grammatical study, is employed by the teachers. In the teaching of Latin emphasis is laid on translations, while composition is not neglected. Latin verse and speech have, however, been dispensed with. In the study of physical science the experimental method is used so far as possible. Generally the active methods are employed; that is, those which tend to awaken the intelligence, and appeal to the judgment rather than to memory.

Educative Forces. — The lycées and colleges do not seek only to enlarge knowledge; their aim is educative as well as instructive. "The final end of instruction is education," according to the official directions. The development of physical education and life in the open is recommended; all exercises and games which can ensure physical suppleness and vigor must be placed within the reach of all. Gymnastic exercises are regularly indulged in, and the Swedish system, which was followed for some time, is being supplanted by the system of M. G. Demeny. Athletics, and especially football, are increasing, and accidents are rare. Further, hygiene has a place on the program in the classes of philosophy and mathematics. As far as intellectual and moral education are concerned, the teachers are expressly advised to direct all their instruction to this end. While transmitting positive knowledge to their pupils, they must think more of forming their character than of giving a stock of information, after the maxim of Montaigne that "A head well-formed is much better than a head well-stocked." They must also develop character by encouraging initiative and energy.

Salaries of Teachers. — The question of salaries is too complex to permit a detailed account. Here it need only be remarked that within the last few years attention has been paid to some measure of betterment and improvement. The salaries of *proviseurs* vary according as they are *agrégés* or not; according to which of the five classes, into which they are distributed, they belong; and according to their residence in Paris or the provinces. The best paid *proviseur* in Paris reaches 11,000 frs. ($2200); in the provinces the lowest salary is from 8000 to 9000 frs. ($1600 to $1800). The salaries of teachers are just as variable. A *professeur agrégé* begins in the sixth class with 3300 frs. ($650), advancing up to the first class with 5300 frs. ($1060), and the special class with 5800 frs. ($1160); but teachers in this class are very few, and only number forty-eight. The condition of teachers in Paris lycées is better; beginning with 5100 frs. ($1020) they rise to 7600 frs. ($1520) in the first class and 8600 frs. ($1720) in the special class. The salaries of acting teachers vary from 2900 frs. ($580) in the sixth class to 4900 frs. ($980) in the first. Principals and teachers in colleges are paid less than *proviseurs* and teachers in lycées. In some well-attended colleges, however, the salaries of the principals depend on the number of pupils, since these schools are run at their own expense and the income may reach a considerable figure.

Cost of Secondary Education. — Although secondary education is not free, the receipts from fees are far from sufficient to cover expenses, which in the lycées amount to about 9,000,000 frs. for the *externats*, and 8,500,000 frs. in the *internats*. The State must, therefore, intervene on behalf of the *externats*, the accounts for *internats* and *externats* being kept distinct. A boarder costs the State almost nothing, since the fees are high enough, but each *externat* student costs the Treasury at least 261 frs. ($52.20). The state subsidy in 1910 was as follows: To supplement the receipts of the *externats* 8,400,000 frs., of the *internats* 584,560 frs. To these sums must be added various sums in aid of salaries, 5,377,650 frs.; for the allowance to *agrégés* 702,000 frs.; for general expenses 177,800 frs. If to this be added the subsidy to the colleges, which are for the most part maintained by the communes, about 6,500,000 frs., and three or four millions for national scholarships, and various expenses, the State contributes to secondary education twenty-three or twenty-four millions of francs.

Education of Girls. — The public secondary education of girls was established by law of Oct. 21, 1880, which may be called, after its author, *loi Camille Sée.* It was also intended to establish a woman's university and to organize a national system of education of girls by founding public institutions analogous to the lycées and colleges for boys. This was a great novelty, and possibly seemed a very bold proposition. Up to that time there was hardly any education of women; it was provided without regular methods or definite programs and in a conservative spirit only in convents or private schools. The law of 1880, in making the education of women a duty of the State, was, at the same time, the recognition given to the rights of women and the need of education. The undertaking has been marked by success. From year to year, since 1880, the clientèle of the lycées and colleges of girls has not ceased to increase. From year to year the number of institutions established to meet the demand in the towns where no provision had yet been made continued to grow.

There are three types of institutions for the secondary education of girls: (1) national lycées; (2) communal colleges; (3) secondary courses, established by the municipalities and subsidized by the State. As a general rule, these establishments are day schools, but at the request of the municipal council boarding departments may be added to the day schools. In the Paris lycées there are no *internats*, but they are found to a large extent in lycées of the provinces. The secondary courses established in towns of lesser importance are provisional institutions, being, as it were, colleges in process of formation. Each year sees the transformation of secondary courses into colleges, or even lycées. Instruction there given must approximate as nearly as possible that of the lycées.

There are at present forty-eight lycées for girls, sixty-five colleges, and thirty-seven secondary courses. The attendance is about 35,000. At the beginning there were only 10,000; in 1901, 20,000, and in 1908, about 34,671.

Length and Division of Studies. — The course extends over five years, two years less than the education of boys. It is divided into two sections of three and two years respectively. The foundation for the five years' course is laid in primary classes attached to the lycées and colleges; and the course is supplemented by a sixth year, which, however, is provided in only a small number of important lycées for those girls who are preparing for the higher normal school at Sèvres.

Administration. — The lycées, colleges, and secondary courses are each under a directress, assisted generally by a bursar, general surveillants, and tutors, all appointed by the Minister. Further, a board of governors, consisting of the prefect, the mayor, the inspector of the academy, the directress, two municipal councillors, and two ladies, exercises supervision and control over each institution. Finally, committees of patronage, consisting of ladies only, were established in 1896 to promote entrance into the lycées and college, and to watch their progress.

The instructing staff in the lycées for girls numbers about a thousand, of whom 250 are *professeurs agrégées* in science or letters. The rest are only acting teachers, holding only the *certificat d'aptitude à l'enseignement secondaire.* Including all the teachers of drawing, singing, etc., the teaching staff of lycées and colleges numbered, in 1910, about 1275 women. There must be added the male teachers, borrowed from lycées and colleges for boys, who have charge of some classes. But the tendency, which is increasing more and more, is to give girls only teachers of their sex.

Curriculum. — Instruction includes (1) morals; (2) French language, reading aloud, and at least one modern language; (3) ancient and modern literature; (4) geography and cosmography; (5) national history and outlines of general history; (6) arithmetic, elements of geometry, chemistry, physics, and natural history; (7) hygiene; (8) domestic economy; (9) needlework; (10) some notions of common law; (11) drawing; (12) music; (13) gymnastics. Optional courses in Latin have been established recently in some lycées.

"Modern language" here practically means English or German, for almost without exception every school offers both these subjects, while the Italian, Spanish, and Arabic are relatively less important than in the boys' schools. In this essentially "modern" curriculum, the "ancient and modern literature" (a study of the classic writers of Greece, Rome, Italy, Spain, England, and Germany through the medium of the French) is a manifest attempt to supply the lack of direct humanistic influence.

Academic Rewards. — The baccalaureate is rarely sought by pupils in the girls' lycées, nor do the studies give direct preparation for the degree, so that the girl holding the bachelor's degree is rare. But other academic rewards have been established. Examinations are held of a very friendly character, since they take place within the schools, and are conducted by examiners who for the most part are the teachers themselves. These lead up to (1) *Certificat des études secondaires* at the end of the third year; (2) the *Diploma de fin d'études,* at the end of the fifth year. This diploma is demanded of girls who present themselves at the school of Sèvres, or who are candidates for tutorial positions in lycées or colleges. But by a remarkable anomaly holders of the diploma are not eligible for positions in primary schools. A fair number of secondary school students present themselves for the examination for the primary certificate, and holding the *brevet supérieur,* they can demand employment as teachers. Those young women who desire to teach in secondary schools, once they have the diploma, must in the first place obtain the *certificat d'aptitude,* which confers the right to be appointed as acting teacher in the lycées or professor in the colleges. This certificate is for women the equivalent of the licentiate for men. The *agrégation* alone confers the right to an appointment as professor in a lycée. To be a candidate for the *agrégation,* the certificate must have been held for at least one year. A competition takes place each year before a special board in letters and science. The *agrégation* in letters includes two sections, literary and historical, while in science there are the mathematical and the natural and physical science sections. There is no special *agrégation* for women in the teaching of modern languages. The *agrégation* in German and English, which is given to men, is open to women on exactly the same conditions, but they may also present themselves for the certificate of ability to teach modern languages.

Higher Normal School at Sèvres. — When the law of 1880 instituted a system of secondary education for girls, there remained the task of preparing suitable teachers for them. This was provided by the law of July 26, 1882, by which a higher normal school was established for the training of women teachers. This school performs for secondary education the service which the school at Fontenay aux Roses performs for elementary education. It is a boarding school located at Sèvres. Students are admitted by a competitive examination. The length of the course is three years. At the end of the second year the students enter for the *certificat d'aptitude d'enseignement secondaire,* which is competitive; at the close of the third year they present themselves for the competitive examination for the *agrégation.* Instruction is throughout given by male professors, who are selected from the members of the faculties and the Paris lycées and who have the title of *chargés de conférence.* The Higher Normal School is provided for in the State Budget with sums of 155,200 frs. ($31,040) for salaries, and 101,500 frs. ($20,300) for equipment. Only twenty pupils are received each year, in two sections, letters and science. This number is too small to meet the demand for teachers. But the supply of teachers is increased by the number of women who do not enter Sèvres, but prepare themselves elsewhere for the *certificat d'aptitude* and for the *agrégation,* either in the Faculty of Letters or Science, or in private institutions, such as the *Collège Sévigné* or the *Cours de la Mutualité Maintenon,* both in Paris.

Cost of Education. — Secondary education of girls is not free, any more than that of boys. The fees cover the expenses to some extent. The communes and departments also share in the cost. But the State intervenes with large subsidies, inscribed annually in the budget. In 1910 this subsidy rose to 1,536,500 frs. ($307,300) for the lycées, to 723,920 frs. ($144,784) for the colleges, to 227,950 frs. ($45,590) for the secondary courses. To this must be added about one million francs toward salaries, payment of substitutes, renewal of equipment, etc. The whole sum expended by the State was three and a half million francs ($700,000).

Salaries. — The salaries in the departments are fixed as follows: —

In the lycées: —

Class	IV	III	II	I
	frs.	*frs.*	*frs.*	*frs.*
Directress *agrégée*	5000	5500	6000	6500
Directress *licenciée* or *certifiée*	4500	5500	5550	6000
Directress *brevetée*	4000	4500	5000	5500
Bursars	2400	2800	3200	3600
Professors (*agrégées*)	3000	3400	3800	4200
Acting teachers	2500	2800	3100	3400
Primary teachers	1500	2100	2400	2700
Tutors (with rooms, but not board)	1500	1800	2100	2400
Teachers of drawing	——	1800	2100	2400
Acting teachers of drawing	——	——	——	1600
Teachers of needlework	1600	2100	2400	2700
Teachers of singing	1000	1400	1600	1800
Teachers of gymnastics	——	1200	1400	1800

In the colleges: —

Class	IV	III	II	I
Directress	2600	3000	3500	4000
Professors	2500	2800	3100	3400
Acting teachers	1800	2100	2400	2700
Primary teachers	1600	1800	2000	2400
Teachers of drawing	——	1800	2100	2400
Acting teachers of drawing	——	——	——	1600
Teachers of needlework	1600	1800	2000	2400
Teachers of singing	1000	1200	1400	1600
Teachers of gymnastics	——	1200	1400	1600
Surveillantes of the day schools (with rooms but not board)	1400	1600	1800	2200

In the Paris lycées salaries are as a rule higher by 500 frs.

Conclusion. — Secondary education in France, both for boys and girls, is in a satisfactory condition. Within the last twenty years a very liberal discipline has been introduced into the lycées and colleges, which has made school life much pleasanter. It cannot now be said that these schools resemble barracks. Formerly riots were common enough in the lycées; to-day they are a thing unknown. The vacations (two months in August and September, two weeks at Easter, etc.) are frequent enough to allow the pupils to rest and to revive their ardor for work. The studies show sufficiently good results, although there was much talk recently of an imaginary crisis in French education. Greek and Latin alone are losing ground; but in their place modern languages and scientific studies have gained rapidly.

HIGHER EDUCATION.—**Historical.**—The reputation of the University of Paris in the Middle Ages, when thousands of students flocked to Mt. St. Geneviève, is well-known, as also the success of some provincial universities, such as Montpellier. But gradually these institutions declined and became nothing more than shadows of their former selves, without exercising any real influence. In fact, it may be said that they no longer existed, when they were abolished at the Revolution. They were not reëstablished until 1896. The decree of Napoleon of March 17, 1808, for the creation of the University of France divided the country up into twenty-seven academies, and established five different faculties, — theology, law, medicine, science, and letters. Each academy was to have a faculty of letters and a faculty of science. But these faculties, established near each principal lycée, were very poorly equipped with a grant of from 500 to 1000 francs for each, and a few professors, borrowed partly from the local lycées. The faculties of letters included, in the provinces, the professors of literature in the lycées and two other professors, in Paris three professors from the College of France and three professors of literature from the lycées. As a matter of fact, the chief task of the faculties of letters and science was the conferment of the three university degrees of bachelor, licentiate, and doctor. The Restoration considered that this was excessive, and Louis XVIII suppressed at one blow seventeen faculties of letters on Oct. 31, 1815, and three faculties of science. A few were reopened under the July Monarchy, notably Bordeaux, Lyons, Montpellier, and Rennes in 1838, Aix in 1846, and Grenoble in 1847, while the condition of all was improved by the addition of new chairs.

In an article of 1864 Renan severely criticized the condition of higher education, and without denying that there had been brilliant and glorious periods, as in the time of Cousin, Villemain, and Guizot, he deplored the sacrifice of science "to oratorical exercises." He pointed out that there was an "epidemic of brilliant wit" among the professors, and proved that their courses were mainly nothing but brilliant expositions, recitations in the style of declamation and of the rhetoricians of the Roman decadence, that there was not found among them "any movement productive of research." Finally he charged them with not creating scholars, for the good reason that they had none, at any rate in the faculties of letters and science, and were reduced to perorating before an audience of idlers and amateurs. He concluded by saying that, compared with the German universities, the faculties of France were in a shameful condition of inferiority. Things have changed since 1864, and the French universities, revived by the law of July 10, 1896, bring honor to higher education and to their country. The way had been paved to their reconstitution for several years. Since 1885 various decrees had established a general council of faculties in each capital of the academies, charged chiefly with the task of supervising the observance of regulations in studies and of establishing some coördination between the different courses and studies of the faculties and schools for the improvement of education and in the interest of the students. This is exactly the part played at present by the university council.

Present Conditions. — The law of 1896 established fifteen universities, and a sixteenth is about to be established in Algiers. It was at first thought that it would only be appropriate to give the title of university to a group of the most important and complete faculties located in the largest cities. Such a procedure would have caused dissatisfaction to other towns, and would have deprived them of faculties which they had had for a long period. It was accordingly decided to establish a university for each academy, except at the small academy of Chambéry, which had no faculties and only a preparatory school for higher instruction in letters and science. The universities are not yet all provided with complete faculties. There are only two, letters and science, at Besançon and Clermont-Ferrand. There is no medical faculty at Aix-Marseilles, Caen, Dijon, Grenoble, Poitiers, Rennes. There are thus only eight complete universities, Paris, Bordeaux, Lille, Lyons, Montpellier, Nancy, Toulouse, and Algiers, but in those which have no faculty of medicine there is a preparatory school of medicine and pharmacy, where students commence their courses and pass the first examination. The schools of medicine and pharmacy are either complete or preparatory. There are two complete medical schools, at Marseilles, and at Nantes, attached to the University of Rennes. They are distinguished from the preparatory schools in giving a more complete training. There are twelve preparatory schools: Amiens, Angers, Besançon, Caen, Clermont, Dijon, Grenoble, Limoges, Poitiers, Rheims, Rouen, and Tours. The University of Paris has in addition to the four faculties a higher school of pharmacy, but in the provinces this subject is given in the schools of medicine, which are on this account called "mixed faculties."

The universities are established in capitals of the academies; the University of Aix-Marseilles alone does not have a single seat, for its faculty of science and school of medicine and pharmacy are located at Marseilles, the faculties of law and letters at Aix. Generally the universities are located in neighboring or even contiguous buildings, so that the four faculties, which should have a common spirit, may form one whole materially. There are striking exceptions; thus at Paris the Sorbonne only houses under the same roof the faculties of letters and sciences, and a few minor departments, while the faculties of law and medicine occupy separate buildings. Most of the universities, thanks to competition between the State and municipalities, are provided with beautiful buildings, some old, repaired and enlarged; others entirely new and truly scholastic palaces.

Growth of the Universities. — The universities have made a remarkable increase in the number of students within recent years, being about 30 per cent. In January, 1905, there were 31,589 students; in 1909 there were 40,961 male and female students, for the universities are all open to women. The increase is particularly noticeable in the faculties of law, science, and letters; in law there were in 1909, 17,000 students, an increase of 5000, or 40 per cent, over 1905; in science 6408 students, an increase of 1360, or 27 per cent; in letters 6216, an increase of 1992, or 47 per cent. Only the faculties and schools of medicine and pharmacy either fail to show an increase or have actually decreased in numbers. This is due to overcrowding in the professions for which these establishments prepare.

The University of Paris alone has an attendance of more than a third of the students of higher education, 17,512 in January, 1910. In point of numbers, the university stands the first in the world, and surpasses the University of Berlin, which comes second, by several thousands. She is also far wealthier than her German rival, spending seven millions of francs annually, or two millions more than Berlin. These resources come (1) from the state subsidy of 4,000,000 frs. for salaries, and 600,000 frs. for equipment, (2) from her own revenues of more than two millions. Her library contains about 600,000 volumes. The University of Paris naturally offers the largest opportunities in all kinds of instruction. The faculty of law has 33 professors and 2 *agrégés*. The faculty of medicine has 35 professors and 40 *agrégés*, more than 15 superintendents, 55 laboratory and clinical aids, and a number of assistants in anatomy. In the faculty of science there are 23 professorial chairs, 15 *cours complémentaires*, 13 *conférences*, 20 directors, or laboratory assistants, 59 preparators, with a number of mechanics and heads of workshops. The faculty of letters has 33 chairs, 19 *cours complémentaires* and 16 *conférences*. The higher school of pharmacy, an integral part of the university, has 12 professors, 9 *agrégés*, and 35 superintendents and preparators. Without including the leaders of the *conférences*, *agrégés*, and acting professors, the University of Paris has 149 professors, who may with justice be said to represent all that is to be known in human knowledge.

The provincial faculties do not fare so well. The courses are almost as numerous; but it is impossible to enter into details of each. The number of professors for all the universities together is as follows: faculties of law, of which there are thirteen (Paris, Algiers, Aix, Caen, Bordeaux, Dijon, Grenoble, Lille, Lyons, Nancy, Poitiers, Rennes, Toulouse), with 164 professors, 20 *agrégés*, 163 *cours complémentaires;* faculties of medicine, of which there are seven, with 133 professors, 92 *agrégés*, 35 *cours complémentaires*, 53 directors and assistants, 54 heads of laboratories and clinics, and a large number of preparators and assistants in anatomy; faculties of science in all the universities, with 144 magisterial chairs, 14 *cours complémentaires*, 51 *conférences*, 49 laboratory superintendents, 115 assistants; faculty of letters, one for each university, with 142 magisterial chairs, 18 *cours complémentaires*, and 50 *conférences*.

Appointment of Professors. — The professors in the universities are appointed by the Minister of Public Instruction. They must hold the doctorate in their respective faculties. In addition, in the faculties of law and medicine the professors must have obtained the *agrégation* in law or medicine in competitive examinations. This condition was also imposed for a time on professors in science and letters, and the *agrégation* of the faculties was the usual qualification for all candidates for positions in higher education, but this rule has fallen into disuse, and in science and letters the doctorate is the only degree expected, as also in the case of rectors. But appointments are not made directly to professorships. In the faculties of law and medicine the teacher enters on his career as *agrégé*, in science and letters as acting teacher or director of *conférences*, with a lower salary than the professors. Appointments to professorial chairs are not made before the age of thirty. When a chair already in existence is to be filled, the council of the faculty, and, after it, the council of the university, present a list of nominations, containing at least two candidates, to the Minister for his selection.

Salaries. — The professors of the University of Paris are divided into two classes, and receive from 12,000 frs. to 15,000 frs. ($2400–$3000). In the provinces the professors are divided into four classes, paid from 6000 to 12,000 frs. ($1200–$2400). The deans receive an additional salary in Paris of 3000 frs. ($600), and elsewhere of 1000 frs. ($200). An *agrégé* in law receives 7000 frs. in Paris and 3000 frs. in the provinces; in medicine 3000 frs. in the provinces and 4000 frs. in Paris. Promotions from class to class are made on the first of January each year, some by seniority, some by selection on the recommendation of the Minister to the Consultative Committee (section for higher education). The list of recommendations must contain at least twice the number of names required for promotion.

The age for retirement is seventy for professors of the faculties, seventy-five if they are members of the Institute. They may be retained in service, but not on the active list, after consultation with the permanent section of the Superior Council for Public Instruction.

Number of Students. — The number of French and foreign students, male and female, on Jan. 15, 1910, was 41,044, distributed as follows: 16,915 in law (the best attended faculty); 8029 in medicine; 6287 in science; 6363 in letters; 1448 in the mixed faculties and the higher school of pharmacy; and 2002 in the schools of medicine and pharmacy. The male foreign students numbered 3444, as against 33,770 French. The enrollment of women was 3830, of whom 2033 were French and 1797 foreign. The distribution of universities was as follows: Lyons, second to Paris, 2922; Toulouse, 2828; Bordeaux, 2552; Montpellier, 1965; Nancy, 1899; Lille, 1675; Rennes, 1602; Algiers, 1442; Aix-Marseilles, 1236; Grenoble, 1156; Poitiers, 1111; Dijon, 992; Caen, 722; and finally those universities with but two faculties, Clermont, 275, and Besançon, 268.

Organization. — Each faculty is under the direction of a dean, selected by his colleagues and ratified in his appointment by the Minister. He is provided with an assistant. The schools of medicine have a director at their head. The dean presides at the councils and meetings of the faculty where interests and matters proper to it are discussed. But the establishment of a university would serve no purpose, if a common life and a close sympathy between the different faculties were not established. There is, accordingly, a university council, which meets frequently for the discussion and investigation of all general questions. It is composed of the rector, the president, the deans, directors of medical schools, legal representatives, the director of the observatory, if there is one, and two professors of the faculty, elected by their colleagues. Up to 1896 the academic councils decided disputes and questions of discipline, which referred to higher public instruction. The law of 1896 transferred this power to the university council, from whose decisions an appeal lies to the Superior Council of Public Instruction. The university council may make definite statutes, may deliberate, or may give its advice on matters submitted to it. It may pass statutes on the following subjects: coördination of courses, conferences and practical work, which are recommended each academic year by the faculties; on the regulations for free courses; on the dispensation of students from fees; and on the vacations. It may deliberate on the establishment of courses out of the funds of the university; on scientific degrees which can be created apart from the state degrees, etc. The decisions, however, are not binding, as would be the decision of the Minister in similar cases. Its advice may be given on questions submitted by the Minister, on the budget of the faculties; on the creation, transformation, or suppression of chairs paid out of state funds; on regulations dealing with common service; library, cleaning, heating, maintenance of buildings, examination expenses, etc. Thus it is obvious that the universities only enjoy a relative autonomy, the State always retaining some controlling power.

Degrees and Diplomas of Higher Education. — The degrees of bachelor, licentiate, and doctor are conferred by the faculties. In 1905–1906 the University of Paris created 300 doctors in law, 500 in medicine, 30 in science, and 30 in letters. The faculty of law grants two doctorates: (1) in legal sciences, (2) in economic sciences. But in addition to the state degrees, the faculties of science and letters grant special diplomas, called diplomas of higher studies: in letters there are diplomas in philosophy, history, geography, classical languages, modern foreign languages; in science there are diplomas in mathematics, physical science, and natural science. The faculty of science also grants a certificate of P.C.N. (Physical, Chemical, and Natural Science), which is required for entrance into the medical courses, while for the other faculties the only admission requirement is the baccalaureate in secondary education. The faculty of law gives the *certificat de capacité en droit*, which is required for the profession of attorney. For the medical faculty there is a diploma in dental surgery, and of first and second-class midwives. The courses in pharmacy, which are preceded by a compulsory stage of three years in the office of an apothecary, lead to the title of apothecary of the first class, and, on presentation of a thesis, to that of superior apothecary.

The university degrees are conferred in the name of the State, but since their establishment the universities have instituted a large number of degrees, in conformity with the decree of July 21, 1897. Several have created the degree of university doctor, which does not confer the same rights, although the candidate has passed the same conditions as a state doctor; such a doctor, for example, cannot practice medicine in France. All the universities have established diplomas and certificates, dealing with special studies and sought by different classes of students. Thus the University of Lyons, which ranks among the first in number of students and the rich variety of courses, gives more than ten diplomas of the following type: pharmaceutical diploma for foreigners; diplomas in French, also for foreigners; brevet in electrotechnical studies; diploma in agricultural studies; certificates for notaries; diploma for higher pedagogical studies; diploma in Chinese; certificate in hygiene; brevet in the technical studies of industrial chemistry; certificate of higher studies for young women.

Student Expenses. — A complete course in the faculty of medicine costs a student 1860 frs. ($372), made up as follows: baccalaureate of secondary education, 140 frs.; certificate of P.C.N., 305 frs.; sixteen registrations and library privileges, 520 frs.; laboratory fees, 240 frs.; seven examinations or tests, 220 frs.; seven *certificats d'aptitude*, 175 frs.; thesis, 100 frs.; *certificat d'aptitude* for the thesis, 40 frs.; diploma, 140 frs. The expenses in the faculties of law and science are about the same; in letters they are considerably less, not being more than 550 frs.

Credits. — The students must first of all matriculate; the matriculation is valid for one year, and may be performed at any time in the academic year, the dues being 20 frs. Secondly, they must register at definite times each term. On registering for the first time, they must produce their baccalaureate diploma, or, in default, and in certain faculties, with the authorization of the Minister, they must show the equivalent requirements mentioned in the decree of July 28, 1910. Foreign students may obtain credits for the baccalaureate by producing a degree or definite title or evidence of the studies pursued by them in the country of origin.

Scholarships. — University education, like secondary, is not free, but the State has established a certain number of scholarships relieving students from fees, and gives them free access to the faculties. In 1910 there were set aside in the budget for this purpose 262,000 frs. for provincial universities, and 114,000 frs. for the Paris University. These scholarships are given either to candidates for the licentiate or for the *agrégation* in those universities which are in a position to prepare for the examinations. There is further set aside a sum of 106,000 frs. for scholarships for research, travel, and study in a foreign country. Finally, each university gives to a certain porportion of the students dispensations from fees for registration and courses.

Private Resources of the Universities. — The law of 1896 gave the universities the rights of a civil person, that is, the right of accepting gifts and legacies, of holding private property, and of administering it without restrictions. Each university has a budget in which are included the receipts from fees for courses, registration, library and laboratory fees paid by the students in accordance with the regulations. The income from this source may be spent on the following objects: expenses for laboratories, libraries, and collections; creation and maintenance of buildings; establishment of new courses; grants in the interest of students, as, for example, subsidies to student associations. The French universities have not, up to the present time, met with such generous donors as those of the American universities, but a good beginning has been made, and at the University of Paris the names of benefactors are inscribed on a marble tablet; while Lyons, Montpellier, Bordeaux, and others have also received important gifts.

State Expenditure. — The French universities do not enjoy complete financial autonomy, and in fact they could not exist on their own resources. The contribution of the State toward their expenses is considerable, the salaries, for example, coming from this source. But the State, on the other hand, benefits from certain sums which are deposited by the universities, and cannot be freely disposed by them. According to Article IV of the law of

1896, "Fees for examinations (for baccalaureate, licentiate, and doctorate), the *certificats d'aptitude*, diplomas or titles, paid by candidates for the degrees or titles established by the law, shall continue to be collected for the benefit of the Treasury." In 1907 the receipts of the State from this source amounted to 5,184,775 frs. ($1,036,955).

The University of Paris is provided for in the budget to the extent of 3,920,199 frs. ($784,039.80), for salaries of professors and assistant instructors, library, other services, and payment of minor officials. The cost of the provincial universities to the State is 7,520,580 frs. ($1,504,316). To this must be added the expenses for equipment, which amounted to 2,229,827 frs. ($445,965.40). (The figures here given are from the budget for 1910.)

École pratique des hautes études.—This school was established in 1885 for the purpose of providing the practical work which would establish and extend the theoretical instruction. It includes five sections, (1) and (2) mathematical, physical, and chemical science ; (3) natural sciences ; (4) history, philology, and architecture; (5) religious sciences. This school is a part of the University of Paris, from which it borrows a large number of its professors, who hold the title of *maîtres de conférences.*

Higher Normal School. — This school, for a long time independent, is now attached to the University of Paris. Its director, at present M. Lavisse, is a professor in the faculty of letters. The students attend the courses at the Sorbonne. A special competitive examination is held each year to recruit students for both sections, letters and science, of the school, which is free.

Observatories. —Instruction and research in astronomical studies are given in the eight observatories of Paris, Besançon, Lyons, Bordeaux, Marseilles, Toulouse, Puy de Dôme, and Pic du Midi. The observatories are under a director and an administrative council ; that at Paris is an independent institution; those in the provinces are parts of the universities in whose territory they are located.

Collège de France. — Established by Francis I about 1530, with only two chairs, Greek and Hebrew. In 1545 there were already twelve professors, or royal lecturers, as they were called ; at present there are forty-five. It was here that Claude Bernard and Renan, to mention these two names only, taught. The institution is entirely independent and distinct from the University of Paris. It stands for scientific freedom. It is directed by an administrator selected by the professors, who are themselves appointed by the Minister on the recommendation of the professors in office and of the academies of science and moral and political sciences of the Institute of France. The courses are very varied, and are given in the form of public lectures. The salary of the professors is 10,000 frs., while there is set aside in the budget for salaries and equipment in the college about 6500 frs.

Other Institutions. — Among those institutions which should be included in the system of higher education are the following: *l'École des Langues Orientales Vivantes; l'École des Chartes,* which gives a training in the keeping of archives and paleography; the Museum of Natural History, where instruction in all branches of natural science, and particularly in their application to industrial and commercial arts, is given. These institutions are independent, and are not connected with the University of Paris. Further, the following special government schools may be considered under higher education: *École Polytechnique* for artillery officers, engineers, etc. ; the military school at St. Cyr (see MILITARY EDUCATION) ; the naval school at Brest (see NAVAL EDUCATION) ; the school of roads and bridges; the school of mines ; and the central school of arts and manufactures for training civil engineers, etc. (see TECHNICAL EDUCATION).

Private Higher Education. — The freedom of teaching, recognized by the laws, extends to higher education just as to the other two branches. This, however, has only been in existence since 1875, when the establishment of a free university was about to be authorized with power to grant state degrees. But the law of March 18, 1880, decided that a free institution could on no account assume the name of university, and that the granting of degrees was exclusively reserved to the State. Those students in free faculties who desire to obtain degrees are subject to the same rules of study and academic qualifications as the students in the state faculties, and like them they must present themselves for examination before the state professors. Neither associations nor individuals have availed themselves much of the freedom given to them. The Catholic Church, however, has established a number of faculties. There are at present twelve free faculties: five of law, at Paris, Marseilles, Angers, Lille, and Lyons ; one mixed faculty of medicine and pharmacy at Lille ; three faculties of science, and as many of letters at Angers, Lille, and Lyons. In addition faculties of Catholic theology have been established at Lille, Angers, Toulouse, and Paris. There is also at Paris a free school for higher scientific studies.

Influence of the Universities. — The French universities do not labor for France alone. The number of foreign students is continually increasing. In a few universities holiday courses have been organized especially for these, which are very well attended, notably at Grenoble, where as many as 589 students have been enrolled. At Lyons and elsewhere special certificates have been instituted for foreigners who regularly pursue an ordinary course or make progress in the studies specially established for them. Further, American professors have delivered lectures in their own language at Paris, and several provincial faculties have their own foreign lecturers. Finally, without mentioning the schools of Rome, Athens, and Cairo, the French universities reach out to neighboring countries by means of dependent institutions. Thus Grenoble has established the Institute of Florence, where Italians may study French language and literature, and Frenchmen may study Italian language and literature. In the same way the universities of Bordeaux and Toulouse, bordering on Spain, are about to establish a French Institute and a school for higher Spanish studies. A Bureau of Inquiry, established in 1903, exists at the Sorbonne to give information on the means for pursuing all kinds of studies in Paris.

G. C.

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FRANCE, EDUCATION IN THE COLONIES OF. — The colonies and dependencies of France, exclusive of Algeria and Tunis, are roughly estimated to comprise an area of 3,820,000 square miles, with a population of 49,000,000. Algeria, though called in France "the great colony," is now administered as an integral part of the State, and Tunis is under the ministry of foreign affairs. The colonies proper may be most conveniently grouped by their continental relations, as in this survey.

Widely separated as these possessions are, representing totally different conditions as regards both the native inhabitants and the French settlers, or colonists, they have been brought under one general administration, following the usual centralizing policy of the French government. A separate ministry for colonial affairs was created in 1894, and a general plan of local administration has since been pursued in the several colonies. There is a resident governor, or other chief executive, in each, who is assisted by an elected council, representative government being encouraged where circumstances permit. The older colonies have representation in the French legislature. Réunion, Martinique, and Guadeloupe send each one senator and two deputies; French India, a senator and a deputy; Senegal Guiana, and Cochin-China, a deputy each. The remaining colonies are represented only in the superior council of the ministry, which consists of the colonial representatives and other persons appointed on account of their special knowledge of the interests to be considered.

The course of modern education in all these colonies has been practically the same: the Church, or more particularly, the teaching orders (*congréganistes*) were the pioneers in the work, and, later, the official, secular system was introduced, and tends, as in France itself, to displace the clerical system. In the later acquisitions, and particularly in the Asiatic colonies, India, Cochin-China, etc., the influence and instruction of the teaching orders have greatly promoted the interests and prestige of France.

The American Colonies. — Prior to 1832 no effort was made by the French government to provide for education in the French Antilles, Guadeloupe and its dependencies, and Martinique. Schools were, however, maintained by the teaching orders, and in these free instruction was given. In 1840 a subvention of 200,000 frs. ($40,000) was allowed from the French treasury for education in Martinique; and a decree of April 27, 1848, established gratuity of instruction and required each commune to maintain two schools, one for boys, the other for girls. A similar decree was issued for Guadeloupe, and, as the slaves were freed in the same year, the need of school provision became urgent. Practically the teaching orders controlled the work until the French Republic was firmly established. After 1880, following the course of events in France itself, the laws that rendered the French schools secular, gratuitous, and obligatory upon the communes, were extended to these islands. By a decree of July 24, 1895, the direction of education in each was committed to a chief officer of public instruction, subject only to the Governor-General. Since that date, public communal schools have multiplied, and clerical schools have declined. Two public normal schools were established in Martinique in 1883, one for girls, annexed to the boarding school for girls at St. Pierre; the other for boys, annexed to the lycée (classical school) at the same place. Higher education is represented by a law school at Fort-de-France. Guadeloupe has, also, a normal school for boys. According to the latest official statistics, the attendance at the different classes of schools in 1909 was as follows: Martinique (population 203,000), primary schools, 13,878 pupils; secondary, 559; normal, 23; law school, 150; Guadeloupe (population 182,000), primary schools, 12,282 pupils; secondary, boys 263, girls 465; total, 728.

The progress of education in French Guiana has been adversely affected by the chief industry, mining, in which the majority of the colonists are engaged, and by the peculiar conditions of the penal settlement; as in Martinique and Guadeloupe, the French laws governing public instruction have been applied, and in 1909 there were twenty-four primary schools in operation, with about 2300 pupils, a little less than 6 per cent of the population. In Cayenne, a college is maintained, and also a local museum and public library.

The small islands of St. Pierre and Miquelon are well supplied with primary schools, and in 1909 reported 495 pupils in public schools, 337 in private schools, and 136 in infant schools, or a total of 968 children under instruction, which was about 10 per cent of the population.

The African Colonies. — As regards the African possessions, the greatest advance in education has been made in those that have been longest under French dominion, namely Senegal, Réunion, and Madagascar. The four municipal communes of Senegal, St. Louis the capital (population 24,600); Dakar, a fortified naval station (population 24,800); Rufisque (population 12,446); and Gore (population 1500) have primary schools modeled on those of France, and following, so far as possible, the same programs. At St. Louis a secondary school is maintained, to which pupils are sent from all the West Africa colonies, and a normal school for the training of native teachers; at Dakar there is a technical high school, common to all the colonies. The natives of the four towns named are French citizens, and the main purpose in their education is to make them serviceable to the administration as agents in the efforts to extend modern ideas among the surrounding people. Special efforts have recently been made to assure a steady attendance of 100 students at the normal school, thus providing for twenty-five graduates a year, prepared to carry on the work of civilization in the villages.

The colonies of West Africa include, in addition to Senegal, Upper Senegal and Niger, French Guinea, the Ivory Coast and Dahomey, with a population estimated at 11,000,000 and upwards. By a decree of 1903, an Inspector-General of Education was appointed for the entire territory with headquarters at Dakar. The Governor-General has since appointed several commissions to inquire into the condition of education and advise as to means for extending the school provision among the natives. This is a difficult problem, as about 70 per cent of the people are Mohammedans and the remainder pagans, excepting a small body of Roman Catholics, numbering about 15,000, and 3500 Protestants.

The total number of French schools reported in Senegal in 1908 was thirty-nine, viz. thirty-five public, with 3608 pupils, and four private clerical schools with fifty-three pupils. In French Guinea, in the same year, there were twenty-two public schools, with 1304 pupils, and two clerical schools, with 67 pupils.

In Upper Senegal and Niger there were fifty public schools, with 1639 pupils, and two clerical schools, with 95 pupils. In the entire territory about 10,000 boys were receiving instruction in French schools. The number of Mohammedan schools in this extended region is unknown, but they greatly outnumber the French schools. In the four municipal communes of Senegal there were reported 117 schools of this class in 1902, with 2127 pupils, including 484 girls. Excepting in one higher school at St. Louis, the instruction given was limited to citations from the Koran and very elementary accounts.

The need of extending a knowledge of the French language among the natives is urgent, since contact with the dominant people has inspired them with the desire for written language; and having none of their own they are turning to the Arabian, and thus coming more and more under the influence of the Mohammedan faith. This is a cause of anxiety to the French authorities, who, though entirely neutral in respect to religion, have reason to apprehend trouble from the fanatical spirit of Moslem converts.

The history of French schools in the island of Madagascar dates from 1880, in which year the *Frères des Écoles Chrétiennes* opened their first school in the island. The mission society of London had about 1200 schools in the island at that time, and at Tananarine had established a college and a normal school. These mission schools, excepting the college, which had been closed, were taken over by the Paris society of evangelical missions in 1897. They are now known as French Protestant schools. The work of the Christian Brothers, interrupted by the Franco-Hova war, 1882–1884, was resumed again, and has steadily progressed.

Other missionary societies, the Friends, Lutheran, etc., have carried on the work of instruction and evangelization in the island; and in 1895 it was estimated that the greater part of the central tribes, including the Hovas, had been Christianized. The Christian population included 450,000 Protestants, and 50,000 Roman Catholics. The purpose of the government to establish a system of public secular schools was indicated by a decree of Dec. 11, 1895, and in 1904 a decree was issued giving formal organization to the service. The schools for the French and other European colonists are maintained on an independent basis, and are classified like those of France. The schools for the natives are primary, regional, and higher. The primary schools are attended by boys and girls from eight to thirteen years of age, the obligatory school ages. The course of study includes the native tongue and the French, and the elements of arithmetic, hygiene, agriculture, history, geography, and drawing. Each school has a garden, if possible, in which the boys work an hour and a half daily; the girls employ the same time in sewing and cutting out garments. In addition to the master, a woman assistant is employed in every school to teach sewing and domestic arts. The regional schools are established at important centers. In their complete stage they include a general course of study, covering two years, and an industrial or technical course of three years. The general course prepares for admission to the normal school. The headmaster of a regional school is always a European; the assistant professors and teachers may be natives. The class of higher schools includes a normal school, school of commerce and administration, higher technical school, and school of medicine. For the direction and control of this system the island is divided into four circumscriptions; the official staff includes one general director, two inspectors of primary instruction (European), and three native inspectors.

The actual development of this system is shown by the latest official statistics, which bring the record to 1909. Estimated native school population, 320,000 (170,000 boys, 150,000 girls); number of schools: 389 public, with 31,736 pupils; 301 private, with 24,329 pupils. In all these schools the teaching of the French language is obligatory. The public schools included seven completely organized regional schools and two having only the general course, also five industrial schools for girls. The number of French, or other European, children of school age was estimated the same year at 1875 (999 boys, 876 girls). All of these were in attendance upon urban primary schools, or in secondary schools maintained at Tananarine.

The island of Réunion is one of the earliest colonial possessions of France, the occupation dating from 1767. Education has followed there the same course as in Martinique and Guadeloupe, the French laws regulating public instruction having been extended to the colony in 1890. In 1909 there were 122 public primary schools in the island, with 216 teachers (104 men, 112 women) and 9206 pupils. Of the latter 4428 were in schools for boys only; 3962 in schools for girls only, and 816 in mixed schools. There were also thirty-nine private schools, classified as follows: secular schools, thirteen, with 38 teachers and 611 pupils; clerical schools, twenty-six, with 81 teachers and 3488 pupils (1023 boys, 2465 girls).

At St. Denis there is a lycée for boys, to which is annexed a normal course for young men intending to be teachers. A course in manual training is also maintained, and special efforts are being made to increase the provision for technical instruction in the island.

No attempt has yet been made to establish a system of public instruction in the French Congo region; mission schools numbering forty-three for boys and ten for girls are reported, with about 3500 native pupils.

One of the most important institutions established by the French in West Africa is the school for the sons of chiefs, founded at Kayes on the Senegal River in 1886. In addition to the three grades of an ordinary primary school, *i.e.* elementary, intermediate, and higher, there is a technical department, which has been in operation since 1903. This department is provided with workshops, and is in charge of special professors. The pupils who live in the institution are sons of chiefs and dignitaries, and attend the school from the ages of seven to fifteen years. The general course of study prepares for the technical department, which draws pupils also from the several regional schools. This department is equipped for work in wood and iron, telegraphy, and training for medical assistants and for agriculture. The young men who have passed through the school exercise great influence upon their native communities, and are also well fitted for posts in the public service.

In the colonies of Australasia and Oceanica little progress has been made in the establishment of public schools, but private clerical schools are aided by the local authorities. At Noumea, New Caledonia, there is a college with general and technical departments, and at Yahone an agricultural school. At Papeete, the chief town of the island of Tahiti, there are six public primary schools and a normal school.

The Asiatic Colonies. — The French colonies in Asia consist of five dependencies in India, of which the chief is Pondicherry, and French Indo-China. The latter includes five states: Annam, Cambodia, Cochin-China, Tonking, and Laos, with an estimated population of 18,230,000. The territory of Kwang-Chau-Wan on the coast of China was leased from the empire in 1899, and placed under the authority of the Governor-General of Indo-China. The development of modern secular education in this vast region was a feature of the colonial policy advocated by Jules Ferry during his brief term as Minister of Foreign Affairs. (1883–1885), and practically attempted by Paul Bert, who was Governor-General in Indo-China in 1886. In respect to the territory as a whole, the purpose thus brilliantly inaugurated has never passed beyond the theoretical stage, but it has led to some notable experiments in education which illustrate both its underlying principles and their adaptations to oriental conditions. The governor of each colony has charge of education in his own province, and appoints the supervisor and the teaching personnel. No one is admitted to the service who is not provided with a teachers' diploma or a university degree. The men teachers in the schools for Europeans and the principal teachers in the schools for the natives are drawn from France; the women teachers, as a rule, from the resident population.

The endeavor to instruct the natives through the sole medium of the French language, and in entire independence of the ancient system of education, has not proved satisfactory, and in 1906 was definitely abandoned. This change was due in part to the effect of the Russo-Japanese war, which impressed the native mind with the value of western learning and the intellectual superiority of the Japanese. The importance of fostering this awakened interest was fully appreciated by the French authorities; at the same time they desired to guard against adverse influences and superficial training, and to enlist the support and sympathy of the élite class of the native population, who still hold to the traditional culture of the Orient.

Under these circumstances the Governor-General of Indo-China took the lead in the adoption of a reformed system of education, of which the main features are as follows: development of the modern and the ancient learning from a common basis, designated as education of the first degree. To this succeeds education of the second degree, followed by the third degree. Each of the two higher degrees comprises two sections, the one traditional, the other Franco-Annamite. The programs of the two sections include subjects common to both. The mandarins charged with the traditional instruction are subject to the local authorities, and it is proposed to raise their salaries, as rapidly as possible, to the level of those of the French teachers. For instruction in the elements of arithmetic, geography, physics, chemistry, and hygiene, the maternal language of the natives is employed instead of French. Native teachers are eligible to the inspectorate, and several candidates are making special preparation for this branch of the service. In view of the passion for civil appointments and the abuse of examinations under the oriental system, it is decreed in French Indo-China that after 1912 persons above thirty years of age shall not be admitted to the literary examinations of the higher degree of the traditional learning.

Theoretically the new system has been adopted for the five states of Indo-China, but it has been most fully applied in Tonking. Here the elementary stage of the course of instruction is carried out in the schools of the larger villages ; the course of the second degree is maintained at the chief places of Phu and of Huyen, divisions comparable to the departments of France ; the course of the third degree is given at the chief place of each of the fourteen provinces of Tonking, the section of the traditional instruction being conducted at the school of the Mandarins (*Doc-hoc*), and the modern section at the Franco-Annamite school. An examination is held at the completion of each section of the course, and marks the end of the traditional course of study. In deference, however, to the customs of the people, two competitive literary examinations are held subsequently; the first of these takes place three years after the completed course of study, at the chief places of Tonking and Annam ; the second examination occurs after a second interval of three years, at Hue, the capital of the ancient empire of Annam. The laureates of the first competition receive the degrees of *Cu-nhon* and of *Tutai*. These fortunate ones, if under the age of thirty years, are eligible for the second examination which secures the degrees of *Tien-Si* and of *Pho-bang*, which are required for the higher positions in the native administrations.

The students who complete the third degree of the Franco-Annamite instruction are prepared for an advanced course, which for the province of Tonking is given at the *Collège du Protectorat*, situated at Hanoi. This instruction represents the highest type of French schools in the Orient. The course of study is arranged in two cycles. The first cycle covers three years, devoted to general studies corresponding to those of the higher primary schools of France, with the addition of the study of Chinese characters. An examination is held at the end of the course which entitles the student to the certificate of " the complementary course."

The second cycle, covering two years, comprises four parallel sections, as follows : (1) administrative section, intended to prepare interpreters and secretaries for the public service ; (2) normal section for the training of teachers and candidates for admission to the school of medicine ; (3) commercial section ; (4) technical section, which prepares for positions in the telegraph and railway service and in public works of various kinds. Students who complete this cycle and pass the final examination receive a diploma, with the mention of their special section. The college has a boarding department, and also a select preparatory division which serves as a practice school for the normal students.

The present Governor-General of Indo-China, M. Klobukowski, is in full sympathy with the reformed system adopted by his predecessor, M. Beau, but proposes to carry it still farther by organizing the secondary schools in two sections, a section of letters comprising in the same program French literature and the oriental classics, and a technical section comprising three divisions : agricultural, industrial, and commercial. At the same time M. Klobukowski is making special provision for the education of native girls.

Of necessity the system of modern education, elaborately planned by the French authorities in Indo-China, has thus far made but little real progress. Official reports for 1909 give the following particulars : Cochin-China (population 2,968,529) had 350 communal and cantonal schools and many private schools. About 40,000 pupils were receiving modern instruction. Schools for girls were conducted in all the principal towns, the most flourishing at Saigon.

In Tonking (population 10,000,000) thirty-eight schools had about 4600 pupils in the Franco-Annamite sections. The schools for girls at Hanoi enrolled 173 pupils, and that at Namdinh, 107. The *Collège du Protectorat* registered 200 boarding and 400 day pupils. The principal teachers in the modern schools of Indo-China are trained in the *Ecole Jules Ferry*, maintained by the *Mission laique française* at its seat in Paris. This society inspired by the enthusiastic purpose of its founder conducts a vigorous propaganda in the interests of French secular education in the Orient. The French schools for Europeans in Indo-China are similar to those of France. In 1909 there were seventeen public schools of this class, with 1087 pupils.

In all the French colonies the support of the public schools is derived from local funds, municipal or communal and provincial, with subsidies from the colonial treasury and from that of France. The French colonial budget for 1909 carried a total of 6,008,139 frs. ($1,201,628) for public instruction. This sum was distributed as follows: colonies in America, 2,078,022 frs. ($415,605); in Africa, 2,521,213 frs. ($504,243); in Australasia and Oceania, 183,149 frs. ($36,630); in Asia, 1,225,755 frs. ($245,151). A. T. S.

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FRANCISCANS. — The name borne by the members of the three great religious orders founded by St. Francis of Assisi (d. 1226), namely the Friars Minor (1209), the Poor Ladies, or Clares (1212), and the Brothers and Sisters of Penance, or Tertiaries (1221). It is the first of these orders that will here be dealt with chiefly, since the educational aspect of the work of the Franciscans is confined very largely to the Friars Minor. In founding this order, however, St. Francis did not intend it to engage primarily in educational work. His aim was to reëstablish by its means the principles of the Gospel and to rekindle the spirit of Christian charity. To this end, piety and not science was the one thing needful. So great, indeed, was Francis's enthusiasm for influencing men's lives by example that he did not at first encourage anything like learning among his followers. But, with the rapid growth of the new order and the diffusion of its influence in almost every sphere of life, he was obliged to consider conditions foreign to his original design. Already in the lifetime of St. Francis his friars began to frequent the universities, and within thirty-five years after his death they had become as conspicuous for intellectual activity as the Dominicans, with whom the Franciscans share the most prominent place in the revival of learning.

Intellectual Activity. — The Franciscans soon perceived the need of acquiring a hold upon the centers of education. In 1230 they established a school for their own members in Paris, which soon became so famous that it was incorporated with the university, where the Franciscans subsequently held two chairs of theology. Six years earlier (1224) their school was opened at Oxford, and, after its incorporation with the university, it became a center from which teachers went out into all England, and even abroad. The Franciscans had also from 1225 a school in connection with the University of Cambridge, which continued to choose its regent from among the friars up to the Reformation. Prior to that time there were sixty-seven Franciscan professors at Oxford and seventy-three at Cambridge. Their influence also made itself felt, though to a less degree, at the universities of Bologna, Cologne, Toulouse, Dublin, Alcala, Salamanca, Prague, Vienna, and Heidelberg, where at different periods the friars filled with distinction the professorial chairs. The great names of Alexander of Hales (d. 1245), St. Bonaventure (d. 1274), Haymo of Faversham (d. 1244), Adam de Marisco (d. 1258), John Pecham (d. 1292), John de la Rochelle (d. 1245), Richard of Middletown (d. *c.* 1300), Roger Bacon (d. 1294), Duns Scotus (d. 1308), and William of Ockham (d. 1347) witness to the leading part borne by the Franciscans in the work of the medieval universities. The order has always retained its place in the van of theological and philosophical learning. Over fifty Franciscans assisted as consulters at the Council of Trent (1545), including the great Spanish theologians De Castro (d. 1568) and Vega (d. 1560).

Besides the two great branches of theology and philosophy, the Franciscans applied themselves eagerly to the allied sciences. From the outset they made great progress in Biblical studies. In all one hundred Franciscans wrote commentaries on the Bible as a whole, while about five hundred produced works on particular books of Scripture. St. Anthony of Padua (d. 1231) drew up the first *Biblical Concordance*, and the *Biblical Dictionary* compiled by John Marchesino (d. *c.* 1300) was in constant use in the Middle Ages. Both these works were surpassed by the *Commentaries* of a third Franciscan, Nicholas of Lyra (d. 1340), the most influential exegete of medievalism, which were often reprinted during the fifteenth and sixteenth centuries and enjoyed a great circulation even among non-Catholics. The first translations of the Bible into Spanish, Polish, and other European vernaculars were made by members of the order. The Franciscans have not been less fruitful in ascetical and mystical writers, and some of their early devotional works have exercised an immense influence upon the spiritual life of the people. Thus the *Meditationes Vitae Christi* almost fashioned the crowds in the fourteenth and fifteenth century, as they assuredly gave rise to the miracle plays by which the friars amused and instructed the multitudes, while the *Speculum Christianorum* of Theodore Coelde (d. 1515) attained such popularity that it was reprinted three hundred times. To the Franciscans, moreover, are due two of the greatest Latin hymns, the *Dies Irae* and the *Stabat Mater*, composed by Thomas of Celano (d. *c.* 1260) and Jacopone of Todi (d. 1306) respectively, while the *Lauda*, the popular sacred song, especially in southern Italy, had its origin in the vernacular poetry of the order. And the early Franciscan legends, which inspired that classic of Italian literature known as the *Fioretti*, were no less the inspiration of thirteenth-century art in Italy.

The Franciscans did not confine their literary activity to the domain of sacred science only. An English friar, Bartholomæus Anglicus, fl. *c.* 1231, was the author of *De Proprietatibus Rerum*, in nineteen volumes, an important encyclopedia of the Middle Ages. Fourteen editions of this vast work appeared in Latin before 1500, and, as it was also made accessible to the laity by translations into the vulgar tongues of most European nations, it exercised a great influence on medieval thought. In the same century John Giles of Zamora, the chief collaborator of Alfonso X in that monarch's efforts to foster education in Spain, published an encyclopedia in six volumes of all the historical knowledge then accumulated. The *Doctrinale Puerorum*, a Latin grammar in verse, written about the middle of the thirteenth century by Alexander of Villedieu, likewise holds an important place in the literature of the Middle Ages. It was printed over three hundred times, and up to the fifteenth century was in use in almost all the schools of Europe.

Nor were the Franciscans without great names in the natural sciences. Roger Bacon anticipated in a marvelous manner many modern scientific discoveries, and Berthold Schwartz (d. *c.* 1384) contributed much to extend the then scanty knowledge of nature by his researches in alchemy. At a later period Luca Paciuolo (*q.v.*) was preëminent for his mathematical attainments. He wrote the first book on algebra ever printed, and did much to bring bookkeeping to comparative perfection. Still later Fortunatus of Brescia (d. 1754) was a pioneer in microscopical research, and Maranus Velloso (d. 1811) one of the foremost among South American botanists. The order has also produced architects like

Philip of Campello (fl. *c.* 1252), the master builder of both Assisian Basilicas ; artists like Jacopo da Turreta (fl. *c.* 1290), who executed the famous Lateran mosaics, and musicians like Julian of Speyer (d. 1250), director of the French royal chapel during two reigns. The Spanish statesman, Cardinal Ximenes (d. 1517), was a Franciscan, and is remembered as a generous patron of learning. He founded and endowed the University of Alcala, and supervised the publication of the Complutensian Polyglot Bible, the first of the class (1502–1510). In the sixteenth century the Irish Franciscans rendered signal service to letters by their celebrated work, the *Annals of the Four Masters* (1632–1636), chiefly compiled by Michael O'Clery, and by their other historical and literary labors directed by such scholars as Luke Wadding (d. 1657), the annalist of the Order and first rector of the Irish College in Rome. During this century also public gymnasia were opened in several provinces of the order, principally in Germany, Belgium, and the Tyrol.

Missionary and Educational Activity. — Notwithstanding their literary and academic pursuits, the Franciscans were first and foremost men of action, not schoolmen or bookmen. Unlike the monks of cloistered orders, they came and went amongst those who had most need of them. From the outset their cloister was wherever there were souls to be saved or hearts to be comforted. They nursed the lepers, helped the laborers in the harvest field and the wounded on the battlefield, cheered the traveler, succored the sick, the sorrowful, and the sinful in the medieval cities. Although they labored for the betterment of all sections of society, yet the Franciscans found their mission mainly among the poor and oppressed. In England they sided with Simon de Montfort in the struggle for liberty, and to their influence may be partly traced the birth of the idea of popular government in different parts of Europe. They were frequently employed as peacemakers between warring peoples and rival factions, and the prolonged efforts of the order to bring about a reunion of the Greek Church with that of Rome are a matter of history. Two Franciscans, Barnabas of Terni (d. *c.* 1474) and Bernardine of Feltria (d. 1494), were chiefly instrumental in founding the celebrated *monti di pieta*, or charitable loan institutions designed to protect the poor against the usury of the Jews. In other respects also the Franciscans did most meritorious social work, notably by their devotion to the plague-stricken in 1528 and at other periods. The erection of hospitals and the care of orphans was another work of mercy to which they dedicated themselves, and in which Ludovic of Casoria (d. 1885) became most conspicuous in recent times. The modern " Apostle of Temperance," Theobald Matthew (d. 1858), belonged to the Franciscan Order.

The great enthusiasm of the friars and their zeal for the spiritual and even temporal welfare of their neighbors, as well as their absolute poverty, which appealed to the faith and idealism of the people, added immensely to their popularity and influence as preachers. They usually preached in the public squares or from the village crosses, and their sermons were cast, not in the abstruse language of the schools, but in the homely phrase of everyday life, and thus appealed directly to the people. The missionary labors of the order were not confined to quickening the piety of European nations ; but were to a large extent accompanied by educational and philanthropic work. And these still remain as features of the order.

Thus in Palestine, where the Franciscans have been active missionaries since 1219, they conduct, in addition to hospitals, dispensaries, and hospices, fifty-nine elementary schools, thirty-eight for boys and twenty-one for girls, besides ten trade schools, and one commercial and classical boarding college at Aleppo, which is renowned throughout the Orient. At Jerusalem there is maintained a printing establishment, from which many educational and religious works in different languages are issued annually.

In China the Franciscans have labored since the thirteenth century. Before its close John of Monte Corvino had built a church " with dome and bells " at Cambalu (Pekin), and was able to report that he had taught Latin and Greek to 150 boys and had converted 600 people, for whom he translated the New Testament and the Psalter into Chinese. At present there are 220 Franciscans in sixteen Chinese missions, including eleven bishops, all of whom belong to the Order. They serve 3049 churches and chapels, and conduct twelve seminaries with 582 seminarians, fifteen colleges with 589 students, 780 schools with 21,965 pupils, besides maintaining orphanages and hospitals. The Franciscan missions in Japan, which were destroyed in 1597, were reopened in 1907. In India the Franciscans had numerous colleges and schools long before the arrival of the Jesuits, who first came there under the Franciscan Archbishop of Goa, John Albuquerque (1537–1553). Four of the principal dioceses in India are now entirely served by the Capuchin Franciscan Friars, and native Tertiary Brothers conduct schools and asylums. Franciscan activity in the Philippines dates from 1577. There, as elsewhere, they established schools and instructed the natives in manual labor — the planting of coffee and cocoa, breeding of silkworms, weaving, building bridges, canals, etc. Of those within the Franciscan pueblos 85 per cent could read and write and knew the elements of arithmetic. Several of the Philippine missionaries wrote valuable works in the vernaculars of the natives. Thus in addition to several catechisms, dictionaries, and grammars, which were often reëdited, John of Plasencia (d. 1580) composed a history of the Philippines, dealing particularly with the rites, usages, and customs of the natives, which long remained the standard authority on the subject.

America. — As is well known, the Franciscans were the first missionaries in America, seven members of the Order having accompanied Columbus on his second voyage; and at Hayti a Franciscan opened the first Christian church in the New World (1493). The first schools in America were opened by the Franciscans in connection with their churches at Nueva Isabella and La Vega, and there the Indian boys were taught reading, writing, and singing. The Franciscans were also the first missionaries on the mainland or continent of America (1512). Not to speak of the labors of the order in Brazil, where since 1891 five new missions have been established among the more savage natives, Peru, Chili, Argentina, Paraguay, Bolivia, and Venezuela, it was Franciscans who planted Christianity in Mexico (1523), whence they went forth to evangelize Florida (1528), New Mexico (1539), Texas (1685), and California (1769). As early as 1531 the college founded by Peter of Ghent in the city of Mexico was attended by more than 600 Aztec youths, and every Franciscan convent in the diocese had a school attached to it. In these schools as many as 600 or 800 pupils received instruction, food, and clothing from the friars with whom they made their home. These institutions were the first free boarding and trade schools on the American continent. The instruction given in these schools was of a twofold character. Up to the age of nine the children were taught reading, writing, catechism, singing, and instrumental music; from nine years on, the work of the pupils was almost wholly industrial, the common arts and trades of the civilized world forming the curriculum. It was the Franciscan John Zumarraga, first Bishop of Mexico, who set up the earliest printing press in that country (1537–1538) and published the first book there, a compendium of Christian doctrine, in Mexican and Spanish (1539). Out of 118 books printed in Mexico up to 1600, the Franciscans brought out 41. Among these the *Vocabulario* by Alfonso di Molina (1555), containing 510 pages in folio, is still regarded as a standard. The earliest schools within the present limits of the United States were founded in Florida and New Mexico by the Franciscans, who began the work of evangelization and education in the chief towns of the tribes, a school being erected alongside of each church. In Florida the educational work of the Franciscans on a systematic scale dates from about 1594, and in 1606 a flourishing classical school and preparatory seminary for the children of Spanish settlers existed in St. Augustine under their direction. They also conducted a free school at St. Augustine from 1785 until the union of Florida to the United States in 1819. It is worthy of note that Francis Pareja, one of the foremost of the Franciscan missionaries in Florida, published (1612–1617) a grammar, several catechisms, and a number of other works in the Tunuquan language, these being the first books printed in any of our North American Indian tongues. The system of schools set up by the Order in New Mexico comprised in 1836 the entire school population of the tribes or the natives converted to the Faith. The educational work of the Franciscans in Texas began in 1689, San Antonio being the chief center of their missionary activities. In Lower California the school system established by the Order dates from 1769, when Juniper Serra (d. 1784) founded at San Diego the first of the famous Franciscan missions, which were in fact immense boarding schools.

Nothing perhaps is more striking in connection with the remarkable success attained by the Franciscans in converting and civilizing the natives in the region above mentioned than the prominence given to education in their missionary work. There can be little doubt that this was largely due to the wise regulations framed by Cardinal Ximenes (1516) with respect to the natives of the New World, which were the guiding principles of the members of his Order, in providing that each settlement was to have its school as well as its church.

The Franciscans, as Bancroft notes, were the first missionaries ever north of the Potomac, as they had been the first south of it. They were the pioneers of the Gospel in Canada and what are now the Northern and Northwestern states of the Union. As early as 1575 Andrew Thevet published an account of his travels in Maine, and another Franciscan, Gabriel Sagard, was the first to publish a history of Canada (1619). In 1615 the Franciscans inaugurated the missions in the interior of Canada in which the Jesuits labored later on, and they opened many schools for the Indian boys. The first dictionaries in the Iroquois, Algonquin, and Huron languages were compiled by Joseph La Caron (d. 1632) and completed from the notes of Nicholas Viel (d. 1625), both Franciscans. The Franciscans still bear a great share in the missionary work among the American Indians, especially in Arizona, New Mexico, California, Wisconsin, and Michigan, where they conduct a number of Indian boarding, day, and trade schools. At Harbor Springs they publish from their own press a monthly periodical in the Chippewa language. Besides catechisms and grammars in the language of the Chippewas and Menominees, they recently (1910) issued in New Mexico a *Navaho-English Catechism* and an *Ethnologic Dictionary of the Navaho language.*

From the outset the missionaries of the

Order have also furnished very valuable descriptions of foreign countries and peoples. In this class of writings the *Relations* of John of Pian di Carpino and of William of Rubruck, who penetrated through Tartary and Armenia in the thirteenth century, have an enduring value. In many respects the monumental work of Quaresmio (1625) on the topography of Palestine has not yet been superseded. The writings of Hennepin (d. 1706) contain the first description of Niagara Falls and the fullest published account of De la Salle's first expedition, while the *Chronicle* of Epinosa remains a standard work on the missions of Texas.

The *Scriptores Ordinis Minorum* of Wadding-Sbaralea contains over 4000 historical and critical notices of writers belonging to the Franciscan Order, including the names of chroniclers like Salimbene (d. *c.* 1288), historians like Crabbe (d. 1554) and Pagi (d. 1699), and orientalists like Galatino (d. 1540) and Smits (d. 1770). But the great majority of the Franciscan writings are closely connected with the apostolic labors of the Order. For it must be borne in mind that the ideal and mission of the Franciscans is primarily a spiritual one. With this aspect of the work of the Order we are not directly concerned here. It will suffice, therefore, to note that it has produced a great number of saints, of whom 241 have been formally canonized or beatified. Five popes have been chosen from among the Franciscans, including the great Sixtus V (d. 1590). The Order has also given to the Catholic Church over 100 cardinals and at least 3000 patriarchs, archbishops, and bishops. At present there are two Franciscan cardinals and forty-two archbishops and bishops belonging to the Order. Numerically the Franciscans form the largest religious Order in the Catholic Church. The First Order of St. Francis actually numbers about 29,000 members, of whom 16,900 belong to the Friars Minor, 10,000 to the Capuchins, and 1500 to the Conventuals, these being the three great branches into which it is divided. These friars are distributed over the five continents, and possess convents and hospices in almost every part of the world. In the United States the Friars Minor alone have four Provinces, comprising 107 houses and 1010 members, of whom 519 are priests ; they conduct one ecclesiastical seminary, two classical and commercial colleges, and have under their direction 157 parish schools, attended by some 32,000 children, besides five preparatory colleges and twelve houses of study for members of the order exclusively. Those destined to teach in these study houses are required to pursue a special course of higher studies in Rome at the International College of the Order, and to qualify for the doctorate. The official printing press of the Friars Minor is at the College of Quaracchi, near Florence, whence are issued *editiones principes* of the writings of the great Franciscan scholars and other works of varying importance. Here too are published the monthly *Acta Ordinis Minorum* and the learned quarterly *Archivum Franciscanum Historicum.* In spite of the fact that the general usefulness of the friars has been hindered at different periods in their history by more or less mystical disputes among themselves as to the observance of their rule, which, owing to its extreme simplicity, lent itself to a great variety of interpretations, the Order has in all its branches always maintained its great popularity.

As regards the Second Order of Franciscans, known as the Poor Clares, it now numbers about 11,330 nuns, divided among 599 monasteries, of which seven are in the United States. These nuns are strictly cloistered, as the Order was founded at an epoch (1212) when women might not have a share in active apostolic work. At different times and places, however, the Poor Clares have undertaken the instruction of young girls, notably in Mexico about 1530, and it is worthy of mention that the first Sisters' School in the English-speaking states was opened by members of this order in 1801 at Georgetown, D.C.

Not the least useful part of the present educational work of the Franciscan Order has been done by the members of its Third Order Regular, Brothers and Sisters living in community, but observing a more mitigated rule than that of the First or Second Order. Of these Regular Tertiaries, as they are called, there now exist sixteen separate congregations of men, with ninety houses and nearly 1200 members ; of women there are 309 different congregations, with 3217 houses and 46,110 members. The largest number of these Tertiary Franciscans are engaged in teaching in colleges, academies, or parish schools in the United States or in the foreign missions of the Order. In addition to this Third Order Regular, and quite independent of it, is the Third Order Secular, established by St. Francis in 1221, and embracing devout persons of both sexes living in the world under the spiritual direction of the Franciscans. At present 7140 congregations of such Secular Tertiaries exist under the direction of the Friars Minor alone, numbering in all 1,489,611 members. Historically the most interesting point in relation to this Third Franciscan Order is the fact that its organization went far to give the deathblow to the feudal system in Italy, and that as time went on it reckoned among its members many remarkable men, including Raymond Lully, Columbus, Giotto, Galileo, Tasso, Petrarch, Murillo, and Palestrina. P. R.

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FRANCKE, AUGUST HERMANN (1663–1727). — One of the most prominent German educators and philanthropists, the chief pedagogical representative of Pietism (*q.v.*), born in Lübeck. Francke received his early education from private tutors at home. From childhood up he showed an inclination to enter the ministry, and spent much time in religious exercises, regarding the ordinary plays of children as a sinful occupation. In 1676 the precocious boy was sent to the highest class of the Gotha gymnasium, where he came under the influence of the educational reformer Andreas Reyher (*q.v.*), who was attempting to introduce the methods of Ratke and Comenius into the schools of the duchy. In 1679 he entered the neighboring university of Erfurt, which, however, he left in the same year, having through the influence of his mother's family received a lucrative scholarship at the University of Kiel. In Kiel he remained three years, studying chiefly theology, but also attending lectures on philosophy, philology, and history. In order to perfect himself in the study of the Hebrew language, he spent some time with the distinguished orientalist Edzardi in Hamburg. In 1685, having received the master's degree from the University of Leipzig, he began to lecture there, and in the following year formed a club of young university teachers and of students for the purpose of studying the Bible in the original. This club, called the *Collegium Philobiblicum*, attracted great attention, and gained for Francke the friendship of Spener (*q.v.*), who then occupied the position of Court preacher in Dresden. After an absence of about two years from the university, during which time his religious life was deeply stirred, he returned to Leipzig, where his lectures on New Testament exegesis and his religious zeal brought him great popularity, but, at the same time, drew upon him the jealousy and hatred of some of the orthodox professors. In 1690 he was called to a pastorate in the city of Erfurt; but through the enmity of the conservative part of the clergy he was soon deposed from his office, and even driven from the city. At this time, however (1691), he received a call as professor of oriental languages to the newly founded university of Halle. This call represents a turning point in Francke's life. With this professorship was connected the charge of the parish of Glaucha, a poor suburb of Halle, in which Francke soon developed a most zealous evangelistic philanthropic activity. In 1695, having found the sum of seven florins in his collection box, he determined to use it for the foundation of a school for the poor. From this small beginning there soon grew up a large system of educational and philanthropic institutions, which has existed to the present day, and now, under the name of Francke Foundations (*Franckesche Stiftung*), forms almost a suburb of the city of Halle. To the charity school was added an elementary school for the children of the citizens of Halle, then an orphan asylum, a boarding school for boys of well-to-do families, the so-called Pædagogium, and, in 1696, a training school for teachers, the *Seminarium Præceptorum.* Besides these, he established, in 1697, a Latin school, to which the sons of citizens and the more talented boys of the orphan asylum were admitted, and in 1698 a boarding schools for girls, *Gynæceum*, which, however, had to be discontinued in 1705. To house these various institutions, he gradually acquired a large plot of land, on which a number of buildings were erected. The necessary means were obtained partly through gifts, which came in from all parts of Germany, and partly through several commercial and industrial enterprises, a paper mill, a bookstore, a printing press, from which was issued the famous *Canstein Bible*, a pharmacy, and others, the income of which soon became considerable. In 1708 King Frederick I of Prussia visited the institution and conferred upon it valuable privileges.

Francke was a man of remarkable energy and wonderful organizing ability. His fundamental characteristic was a deep religious conviction, which, however, was not a matter of feeling, but of will. Francke's pedagogical writings fall into two classes, but the spirit of pietism underlies both. In the one class he devoted himself to explaining the importance and method of religious teaching, the most important work of this type being the *Kurzer und einfältiger Unterricht wie die Kinder zur wahren Gottseligkeit und christlichen Klugheit anzufuhren sind* (*Short and Simple Instruction for leading Children to True Piety and Christian Wisdom*), first published in 1702, but probably written earlier, as the basis of his pedagogical lectures at Leipzig in 1698 on *De Informatione*

Aetatis Puerilis et Pubescentis (*On the teaching of Children and Adolescents*). In the second class are the ordinances for the management of his schools and for the direction of inspectors and teachers, *e.g. Ordnung und Lehrart der Waisenhaus-Schulen* (*Organization and Teaching Method in the Orphan Schools*), and *Instruction des Inspectoris Scholarum.*

The institutions under Francke's management had the greatest influence on education in several directions. Orphan asylums sprang up throughout Europe, modeled on those at Halle; thus they were soon founded at Königsberg, Züllichau, Langendorf, Stettin, Potsdam, etc. With these institutions were frequently linked up training schools for teachers, which in their turn had considerable bearing generally on the training of teachers in Germany. A new spirit was introduced into the classroom, and was of great importance in educational development. (See Pietism.) A large number of educational leaders went out from Francke's institutions, the most notable being Hecker and Count von Zinzendorf, who founded the institution of the Bohemian or Moravian Brethren. The secondary schools of Francke became centers for the spread of real studies. To the study of Greek, Latin, and Hebrew there were added French, rhetoric, history, geography, mathematics, arithmetic, botany, mineralogy, astronomy, and anatomy, and visits were made to local workshops and factories. But while Francke included these additional subjects for purposes of recreation, his pupil, Hecker, made them the center of studies in the *Realschule* in Berlin. (See Realism.) The foundation continued successfully under Francke's successors until 1770, when the falling off of contributions, the rise in prices, and the disturbed state of central Germany threatened the institution with extinction. From this it was saved by A. H. Niemeyer, who became director in 1785 and secured the interest and good will of Frederick William III, and insured the permanence of the institution.

The *Franckesche Stiftungen* now consist of the following educational institutions: Latin Central School; *Oberrealschule* (founded in 1835 as a *Realschule*); High School for Girls (1835), with which is combined a Normal School for Female Teachers (1879); a boarding house for about 250 pupils in the secondary schools; a preparatory school; a *Bürgerschule* for boys and one for girls; an orphanage for boys (121) and one for girls (18); a *Seminar* for the training of secondary school teachers (1889). The institution receives state support, and is in a position to give a large number of scholarships, including, in many cases, board and lodging. There are about 3000 children and 100 teachers connected with the foundations. Through the present director, Dr. Wilhelm Fries, who is also professor of pedagogy in the University of Halle, a connection is maintained between the University and the schools.

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FRANCKESCHE STIFTUNGEN. — See Francke, August Hermann.

FRANKFORT-a.-M., UNIVERSITY OF. — A proposal to found a University in Frankfort-a.-M., projected for several years, culminated in April, 1911, in definite plans for such an institution to be opened in 1914 with three faculties, law, philosophy, and medicine. Interest centers in this institution as the first seat of higher learning for many centuries in Germany to be founded through private endowments and municipal grants. Although it owes its origin to private initiative, it will be under Prussian state control in the same way as other universities. Frankfort has for some time enjoyed facilities for higher studies, and it is proposed to make these the nucleus for the new foundation. The most important of the institutions has been the Academy of Social and Commercial Sciences, which was established in 1901 through the combined efforts of the town, the Institute for the Common Weal, the Chamber of Commerce, and the Polytechnic society and three other endowed bodies. It is under the authority of the Prussian ministers of Education, and of Commerce and Industry. In addition to providing commercial training, the Institute also offers courses in various phases of administration, in social and political sciences for civil servants, judges, lawyers, and others. Teachers who are preparing to teach in commercial, industrial, and continuation schools, and those who are preparing to qualify as teachers of modern languages in secondary schools, find adequate courses here which are recognized by the authorities. Lectures and conferences are held also on Germanic languages and literatures, psychology, pedagogy, history, art, mathematics, geography, physics, and chemistry. Students who have completed studies equivalent to the requirements for one year military service are admitted. In 1909–1910 there were enrolled 1693 students, of whom 604 were women and 47 were foreigners. Further, the city is well equipped with hospitals and clinics; since 1899 it has been the seat of the *Königliches Institut für Experimentelle Therapie;* of the *Dr. Senckenbergische Stiftung* (*f.* 1763), which maintains a hospital, medical library and institute, and a botanical garden, and provides courses of lectures in the winter on botany, anatomy, and pathology; of the *Freies Deutsches Hochstift,* a foundation for the promotion of higher learning (*f.* 1859); and of several other institutions with similar aims in other branches of study. The greater part of the money needed to establish the new university and to provide an annual income for its maintenance has now been secured. The Frankfort University represents not only popular interest and local initiative in higher education, but also the tendency of university life to drift away from the older foundations in small towns to the larger cities.

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FRANKFORT-a.-ODER, UNIVERSITY OF. — A *Studium Generale* was established here in 1506 by Joachim I of Brandenburg, himself a scholar, with four faculties of theology, law, medicine, and arts. Although the founder intended the institution to be a seat of the humanistic studies, the earliest professors were mere pedants, and the progress was also hindered by the distant location of the town and by plague. In 1537, however, Joachim II entered into negotiations with Melanchthon (*q.v.*) for the reorganization of the university, and when, two years later, he became a Protestant, he made over certain monastic property to the university. Strongly entrenched as the first Hohenzollern university, the institution continued until 1811, when it was necessarily overshadowed by the new foundation at Berlin. As a result, the university was combined with the Jesuit university at Breslau as the Royal University of Breslau (*q.v.*).

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FRANKFORT PLAN. — See Germany, Education in.

FRANKLIN AND MARSHALL COLLEGE, LANCASTER, PA. — An institution formed by the union of Franklin College (1787), Lancaster, and Marshall College (1835), Mercersburg, both institutions which were originally founded for the education of the German population of Pennsylvania. The two were united in 1853, and located at Lancaster. The college is under the general control of the Reformed Church in the United States. The campus of fifty-four acres contains ten buildings. Academic and collegiate departments are maintained. Students are admitted by certificate from approved high schools, or by examination the requirements for which are about fifteen units. Advanced degrees are also given. The faculty consists of sixteen members.

FRANKLIN, BENJAMIN (1706–1790). — The American author, scientist, and statesman; influenced the educational theory and practice of his country and his time in many ways, — through his practical improvements in the art of printing and his influence as a newspaper publisher and editor, and as the author of countless public letters, essays, and pamphlets, and of his *Poor Richard's Almanacs* and his *Autobiography;* through his founding the first American circulating library (1731), the academy that developed into the University of Pennsylvania (*q.v.*) (1743), and the American Philosophical Society (*q.v.*) (1769); through his manifold and multiform civic services; through his scientific discoveries, like that of the identity of electricity and lightning, and his practical inventions, such as the stove that bears his name; through his inestimable patriotic and diplomatic services as postmaster-general, member of the Continental, Constitutional, and many other congresses, as Commissioner and Minister in England and France during and after the American Revolution, and, repeatedly, as president (or governor) of the State of Pennsylvania; and, finally, through his humanitarian leadership in such organizations as the Pennsylvania Society for the Abolition of Slavery. It is, therefore, scarcely surprising that no one has as yet undertaken a definitive tracing of Franklin's educational influence through the masses of contemporary literature, or even through the 20,000 items of his manuscript that are available, in addition to the 1806 items printed in the latest edition of his Works (excellently edited, with a life, by Professor Albert Henry Smyth; 10 vols., 1905–1907).

The educational influences of the *Poor Richard's Almanac* and of the *Autobiography* are, however, obvious. The proverbs invented, adapted, or quoted in the twenty-five annual editions of the former (1732–1757), and condensed in *The Way to Wealth* in the latter year, circulated everywhere in their original form and were reprinted on broadsides at home, and were translated throughout Europe, as "the most famous piece of literature the Colonies produced." Many of their teachings concerning industry, frugality, and resolution, enforced by their humor and preserved by their compact, sententious form, are still current in phrases like "God helps them that help themselves," "Honesty is the best policy," and "Diligence is the mother of good luck."

Franklin's incomplete *Autobiography* (written in 1771, 1784, 1788, and 1789), has been called the most widely read American book, and the most popular book of its kind in any language. More than one hundred editions testify to its extraordinary influence. It completely embodies the ideal of an industry that defined leisure as "time for doing something useful," a frugality that was indifferent to food and furnishings, and a worldly wisdom that knew how to prize every small advantage and took care not only to be industrious and frugal, but also to appear so. It illustrates the ways in which manual dexterity and ingenuity, together with social curiosity and attractiveness, may lead to employment and advancement; and how deference, promptness, and reliability may establish both. It pictures the self-education of a voracious reader, — French, Spanish, and Italian making an easy way to Latin; and study of the *Spectator's* arrangement and expression and of Bunyan's combination of narrative and dialogue leading to a flexible and lively style. The effect of the author's newspapers, pamphlets, and state papers is cited as proof of the usefulness of his method and of the importance of the ability to write easily and well. The detailed accounts of the founding of the library, the academy, and the philosophical society; of the regulation of the city watch, the development of a fire company, the inauguration of street paving, and the improvement of street lighting; and the accounts of numerous larger civic and patriotic services all helped to formulate and promulgate a noble tradition of social and patriotic usefulness. The indication of how one might use public office to help one's self but not to hurt others, the refusal to profit from patents or public contracts, the appreciation of the good that might exist in hypocritical, indifferent, or indecisive public officers, the justification of small deceptions for the public good, the ability to be friendly with political enemies, and the determination never to ask, refuse, or resign an office, — the frank record of all of this is like the beginning of the checkered map of political life in a democracy. The book's reprehension of unfairness, bad faith, unkindness, and open irreligion or immorality helped the upbuilding and maintenance of the social conscience. The usefulness of morality to prosperity and happiness, and the value of the thirteen selected virtues of industry, frugality, cleanliness, order, chastity, temperance, moderation, sincerity, justice, humility, silence, resolution, and tranquillity, — these constituted the foundation of a very practical, if not a very lofty, system of morals. The theology of the autobiography is very simple, — churches being mostly given over to questionable doctrine and sectarian zeal, the worship most acceptable to the Creator and Judge of all the world is service to his creatures. This creed, so forcibly preached and practiced by Franklin throughout his life, found wide, although not always open, acceptance.

Of Franklin's writing specifically concerning education, four occasional pieces are especially important. *A Proposal for promoting useful Knowledge among the British Plantations in America* (1743) recognizes that, while the first drudgery of settling had given place to circumstances that allowed the cultivation of the arts and the improvement of knowledge, men whose observations and speculations might produce discoveries of advantage were yet widely separated; and therefore suggests that their mutual correspondence be furthered by an organization, called the American Philosophical Society, with headquarters and regular meetings in Philadelphia. This society was finally inaugurated in 1769; Franklin continued to be its president until his death; and many eminent men have coöperated in carrying out the plans of the founder, with notable scientific results, down to the present day.

Concerning the academy that has been mentioned, Franklin wrote three conspicuous and various minor papers, and many letters. *Proposals relating to the Education of Youth in Pennsylvania* (1749) first suggested the establishment and outlined the curriculum of the academy. "It would be well if they," it says, concerning the pupils, "could be taught everything that is useful, and everything that is ornamental. But art is long, and their time is short. It is, therefore, proposed, that they learn those things that are likely to be most useful and most ornamental, regard being had to the several professions for which they are intended." The essentials are then indicated, as: clear and rapid penmanship; something of drawing and perspective; arithmetic, accounts, and some geometry and astronomy; English grammar, pronunciation, and composition, taught through oratory and debate and the writing of letters, abstracts, and reports; some geography; biography for its moral lessons; much history, for its illumination of politics, religion, and citizenship, and its incidental incitement to the study of ancient and modern foreign languages; natural history, with observations, excursions, and practical exercises; and, finally, the history of commerce, invention, and manufacture, with an introduction to mechanics. "With the whole should be constantly inculcated and cultivated that benignity of mind, which shows itself in searching for and seizing every opportunity to serve and oblige, — the great aim and end of all learning." *An Idea of the English School* for the academy (1750), gives many specific and often ingenious suggestions for the teaching of English grammar, spelling, pronunciation, reading, and composition, and the correlation of these with other studies, all arranged for six successive classes. *Observations Relative to the Intentions of the Original Founders of the Academy in Philadelphia* (1789) regretfully records, in Franklin's last year, how his yielding to other supporters of the academy of his strong prepossession against including foreign languages in the curriculum was followed by the trustees favoring the Latin and neglecting the English school, until the latter declined and was discontinued. This whole procedure was characterized by Franklin as not only shamefully disregardful of the original constitution of the academy, but also as foolishly prejudiced in favor of ancient customs that were quite unsuited to so new a country.

Finally, there are among Franklin's published writings numerous brief pieces, such as *A Scheme for a New Alphabet and a Reformed Mode of Spelling* (1768) and *A Petition of the Left Hand* (undated), and his many published letters contain much of educational interest. The 20,000 manuscript items of his writing and the countless contemporary sources bearing upon his life and work still await educational exploration. (For portrait, see opp. p. 255.)

C. F.

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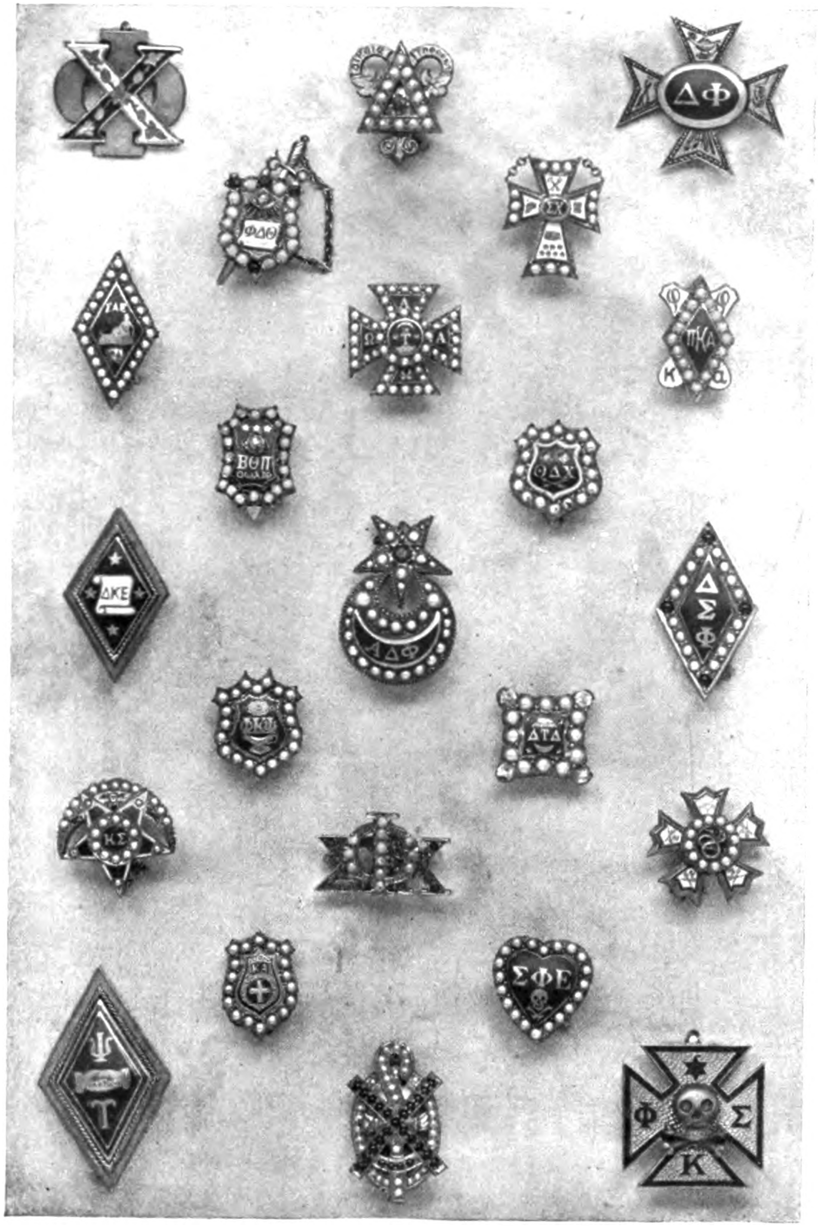
FRANKLIN COLLEGE, FRANKLIN, IND. — A nonsectarian, coeducational institution, which owes its establishment to the Baptist General Association of Indiana (now the Indiana Baptist Convention), organized in April, 1833. In 1844 a college charter was received and a regular collegiate scheme of studies was adopted. In 1847 the first A.B. was conferred. The increase of the student body was interrupted by the enlistment in the Union army of practically all the undergraduates, and in June, 1864, the college closed its doors. In 1868 it was reopened. In 1872 a stock company was formed which purchased the plant. The articles of incorporation prescribed that the president and a majority of the trustees should be Baptists. Waivers having been secured from the original stockholders or their heirs, on Oct. 21, 1907, a self-perpetuating corporation of twenty-four members was created, one third of whom should retire each year. No denominational restriction was imposed. Franklin College was accepted by the Carnegie Foundation for the Advancement of Teaching (*q.v.*) in 1908. Admission is by examination or certificate from approved high school; students from Indiana commissioned schools (*q.v.*) are admitted without examination. The degree of A.M. is given for one year's graduate study in residence. Buildings and equipment are valued at $209,250, the grounds at $35,000. The productive endowment is $246,000, yielding an annual income (1911) of $14,961.04. Fees and tuitions from students amount to $11,200. The average salary of a professor is $1200. There are thirteen members of the instructing staff. The students number 275. C. E.

FRANKLIN COLLEGE, NEW ATHENS, OHIO. — A coeducational institution founded in 1818, offering three full four-year courses in classical, scientific, and philosophical branches, which lead to their appropriate degrees. Departments in music and elocution are also maintained. The preparatory department gives about three years of high school work. The faculty consists of fourteen members.

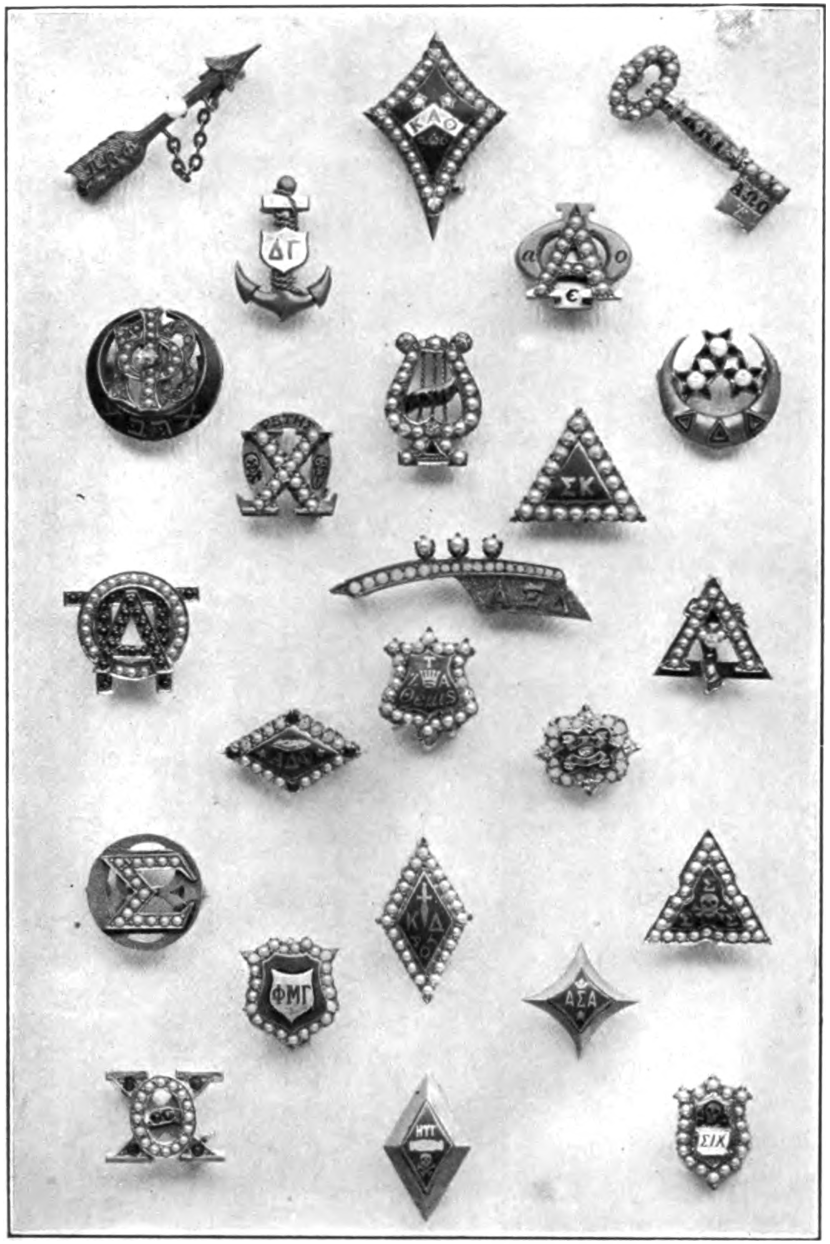
FRANKLIN UNION, BOSTON, MASS. — An institution which owes its establishment to a bequest of Benjamin Franklin (*q.v.*); part of the money at the end of a hundred years was to be expended in " public works which may be judged of most general utility to the inhabitants." The result of the last provision was the establishment of an industrial school built and equipped out of the Franklin fund and maintained from the income of a gift of Mr. Andrew Carnegie. Highly specialized industrial courses are offered in the evening to young men over sixteen under the charge of instructors selected from the leading manufacturing industries. The work of instruction is supplementary to the daily work of the student, and no attempt is made to teach the shop work best learned in the routine of daily employment. Several two-year courses, leading to a certificate, are provided, in addition to shorter courses.

FRATERNITIES AND SORORITIES IN AMERICAN COLLEGES. — Origin and Structure. — The permanent, wholesome, and generally democratic character of American college fraternities, their childish secrecy and lighthearted but eager rivalry, and the seriousness with which they are regarded by undergraduates and by most of their alumni make them unique among undergraduate societies of the world. Their history is a study in Americanism. Its most significant feature is the fact that these clubs have developed, practically without the control or direction of the colleges, from two or three irresponsible groups of boys into a system firmly intrenched in American college life, so widespread that few of the hundreds of American colleges are without " chapters " (as the branches of a fraternity are called); and so responsible that the real estate held by the fraternities aggregates in value well into the millions. The undergraduate and graduate membership of the fraternities includes more than 200,000 men, and, in the sororities, about 25,000 women.

The college fraternity usually traces its growth from a single society called the " mother chapter." This chapter in the early years of the society's existence granted " charters," or licenses to establish chapters in other colleges, to groups of young men whom the original members organized, or who were, for one reason or another, interested in the original society. The prerogative of chartering chapters the " mother chapter," in many fraternities, held for the first fifteen or twenty years of the society's existence, — sometimes even longer. It was gradually replaced, however, by the organization which has come to be common.



Badges of American College Fraternities.



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Badges of American College Sororities.

The fraternity numbers usually from a dozen to fifty chapters, each chapter enrolling about twenty-five members, — a larger membership is regarded as perilous to the close intimacy which is the purpose of the fraternity. These chapters annually elect delegates to a "national convention," held with a chapter or "alumni club" as the host. The convention, besides supplying enthusiasm and social contact between the chapters, transacts such business as determining the general policy and admitting new chapters. During the period when most of the fraternities were rapidly expanding, it was common for a fraternity to reach out into an institution and deliberately "plant" a chapter there. To-day, however, petitioning bodies are organized and assail the conventions, — often unsuccessfully, and not infrequently for many years before admission. The stronger fraternities are now slow to admit new chapters, and both the college and the personnel of the petitioning body are closely scrutinized. Hence, there is evident a steady and consistent attempt on the part of most fraternities to maintain a high character of membership. During the year between conventions, the government of the typical fraternity is intrusted to a "council," — the "executive council" or "grand lodge" — composed of about a dozen graduate and undergraduate members, — in whose hands all administrative business is left. The kind of man who devotes a large part of his time to such work is, among the graduates, pretty much the recognizable type that is characteristically interested in lodges, clubs, and organization in general. But it is not unusual to find men of even national prominence serving upon these bodies; and, indeed, the hold of the better fraternities upon their alumni members, the strong affection kindled by these intimate societies, is a striking feature of the system. The usual organization of the fraternity has its exceptions in the "local" societies, confined to a single college, — often, as at Princeton and Yale, clubs of antiquity and prestige, — and in the curious system congenital apparently to life at Harvard University, where the clubs form a species of pyramid, the larger societies feeding the smaller and more exclusive clubs in the later years of the course. Aside from Harvard, Princeton, and Yale, the American college is usually a "fraternity college"; that is, its social clubs are chapters of national fraternities and draw their membership from all four years of undergraduate life.

Historical Development. — The oldest of the fraternities was organized Dec. 5, 1776, at Williamsburg, Va., as a social and "philosophical" society in William and Mary College. Quite accidentally, the five founders — John Heath was president — selected as a name the three initial letters of a Greek motto, Phi Beta Kappa. The early meetings probably resembled those of modern fraternities, and all the essentials of the present organization were adopted, including grip and ritual. Local chapters were soon established, one, for instance, at Richmond, Va., which admitted noncollegians. In November, 1780, a chapter was established at Yale; in 1781 the parent chapter ceased to exist, because of the troubled times. In September, 1781, the Harvard chapter was established. Chapters followed at Dartmouth and Union. The society was decreasingly active until 1825, by which time it had become wholly perfunctory. In 1831 it was forced by the president of Harvard to reveal its secrets. It gradually assumed its present character of a purely honorary scholarship society, electing members of the other fraternities and women upon equal terms with men. As such a society it plays to-day an important part in the colleges.

With the exception of Chi Phi, a Princeton society existent in 1824 (as was shown thirty years later by the discovery of its constitution), there was apparently no further attempt to found a Greek letter society until 1826, when Kappa Alpha (7),[1] the first college fraternity of the type existent to-day, was founded at Union College. The period in American social life was one of upheaval. Revolutionary ideas from France were met by the conservatism of a still provincial country. Europe, stirred by revolution and fertile in secret societies, had its influence. Just previous to 1826 Masonry was in an unusually thriving condition. The college boy, quick to mimic the larger world, was more than usually interested in "clubs" — always dear to young manhood. The colleges, too, were centers of storms of a kind they do not now know; young Jacobins still dared expulsion with radical speeches, and there was unusual eagerness to defy the powers in control. On the other hand, intense religious enthusiasm could still sweep over a college, and there existed an aggressive missionary spirit. In 1826 the kidnapping and alleged murder of William Morgan in New York for revealing Masonic secrets led to the formation of the important Anti-Masonic Party, which was the first to hold a political convention. This movement, too, had its effect upon the responsive undergraduates; ferment and organization were in the air, and once begun, the forming of college fraternities was inevitably and even feverishly rapid.

As was natural, most of the first fraternities owed their establishment usually to a desire to form a "clique" within some organization, often in one of the large debating societies in which centered the active college politics of the day. Kappa Alpha was founded in November, 1826, upon the disruption of a college military company because of the inability of its members to agree upon a successor to a popular captain. Five members of the class of 1825, four of them members of Phi Beta Kappa, showed, however, that they were more than undergraduates organizing a clique. They perfected a form which has been followed by all college secret societies. In its later history this earliest fraternity has remained conservative in the extreme. The average chapter roll of an intercollegiate society includes about twenty colleges; but Kappa Alpha for years numbered only four, and to-day has seven. The fraternity has also been consistently dignified in administration and careful in the choice of its membership. Its badge, like that of Phi Beta Kappa, is an old-fashioned flat watch-key hung as a charm. The other societies use pins worn upon the waistcoat.

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[1] The figures in brackets denote the number of active chapters.

At Union College, — often called the " Mother of Fraternities," — originated on Mar. 4, 1827, Sigma Phi (9), a rival modeled after Kappa Alpha, and in the same year Delta Phi (12), the last of the so-called " Union triad." Like Kappa Alpha, these two fraternities have remained conservatively small. They constituted the fraternity system in American colleges until 1832, when Samuel Eells, senior of Hamilton College, with four fellow undergraduates, founded Alpha Delta Phi (24). He died after a short but brilliant career as law partner of Chief Justice Choate; but the fraternity he established may be grouped with two others as occupying a position of unquestioned historic importance in American colleges. These two fraternities are Psi Upsilon (23), founded at Union in 1833, and Delta Kappa Epsilon (42), founded in 1844 as a rival to Psi Upsilon at Yale. The chapters of Psi Upsilon have in most instances had histories of steady prosperity, not a common condition; because of the intense competition due to the overcrowding of many colleges with fraternities, chapters are liable to vicissitudes. Delta Kappa Epsilon is the largest of the fraternities, having a membership of more than 17,000. The three fraternities, which have been called the " historic triad," have been less conservative than the smaller members of the early " Union triad." All three have become national in the distribution of their chapters, though Psi Upsilon waited until 1865 before reaching out as far west as the University of Michigan.

Naturally the fraternities did not exist long without encountering opposition. This came not only from college authorities, dismayed at occasional outbursts of youthful mischief and fearful of the creation of organizations beyond the reach of easy control, but also from a large element among the undergraduates, which included two classes of men: the haters of the fraternity from " political " reasons, — members, for instance, of cliques not so permanent or attractive, — and the sterner moralists and unyielding idealists of college life. Often older and more serious, as well as poorer than their fellows, these included many of the honor men, and probably not a few who in the emphatic college slang of to-day would be spurned as " grinds." Especially, too, in the New England colleges the opposition to the fraternities was animated by a spirit much like that narrow but zealous one which in the larger world was opposing Masonry and advocating the establishment of a " Christian " party. When Kappa Alpha entered Williams College in 1833, it found opposition ready. By 1834 the " Social " or " Equitable " Fraternity was founded by thirty-three men, eleven from each of the three upper classes. Then came bitter warfare. By 1847 the Williams Society had united with other " anti-secret " organizations at Amherst, Union, and Hamilton colleges. This opposition to the secret societies received the name of the " Anti-Secret Confederation." The career of the confederation is significant. In 1859 the minutes of the Williams chapter contained the speeches of James A. Garfield, a vigorous leader of the opposition. At the time the Union chapter comprised practically all the students not members of the secret societies, and wherever it was represented, the confederation was at the height of its radical enmity to the fraternities. But even as early as 1858 it adopted Greek letters, and in 1864 it formally assumed the title of "The Delta Upsilon Fraternity " (39). In 1881 the term " Anti-Secret," long a misnomer, was replaced in the constitution by non-secret. It is a proof of the congenital character of the fraternity system in undergraduate life that its only organized undergraduate opposition should have gradually become in all respects but one a fraternity like its former enemies. Delta Upsilon has developed into a society with 10,000 members; though it would not be possible to introduce any element of secrecy within this organization, yet it exists in entire amity with its competitors. The fraternity claims that the influence of its early opposition was important in fixing the democratic character of the system.

The fraternities so far named, all founded in either New York or Massachusetts, and establishing a majority of their chapters in the Eastern states, are included in the group of " Eastern Fraternities." With them may be associated Delta Psi (8), founded simultaneously at Columbia University and New York University in 1847, — a conservative fraternity, selecting its members from families of social position; Chi Psi (17), founded at Union College in 1841, a society admirably organized from the start, and, like Delta Psi, conservative in the selection of its members; Zeta Psi (25), a vigorous fraternity founded at New York University in 1846, the first society to enter Canada, where it established a chapter at McGill University in 1883; Chi Phi (19), founded in 1854, and later comprising the three fraternities of that name, founded respectively at Princeton University of North Carolina and Hobart College (New York); and Theta Delta Chi (27), a fifth fraternity founded at Union College in 1848, and the first to establish the method of government by means of an executive council or " grand lodge."

As early as 1833, Alpha Delta Phi reached out to the West, establishing a chapter in Miami University, Oxford, Ohio, under the personal direction of the founder. Miami University played in the West the part of Union College in the East, and in 1838 presented the college world with Phi Delta Theta (73), following it in 1839 with Beta Theta Phi (73). These two fraternities have been characteristically " western," not only in origin, but in policy and methods. Neither has been in the least conservative; Phi Delta Theta has a roll of seventy-three chapters, not to speak of some twenty-four that have gone out of existence; and Beta Theta Pi is represented in seventy-three institutions, having given up its chapters in twenty-one more. Practically all the fraternities have now become national in scope. For most of them, national extension began about 1870, a date that may be set as the end of the tentative or struggling period of the fraternity system. The typically Western fraternities — now strongly represented in the East as well — have entered numerous smaller institutions, such as Allegheny, Roanoke, and Bethel colleges. The Eastern fraternities have usually been conservative in extending westward, confining their chapters to the larger or better known institutions. One Western college, Kenyon College, Gambier, Ohio, has from the earliest days boasted chapters of the principal Eastern fraternities.

Besides Beta Theta Pi and Phi Delta Theta, originating in the West, other fraternities have had so wide a Western extension as to center a great part of their activity in that section of the country. Such, for instance, are Phi Gamma Delta (57), and Phi Kappa Psi (44), both founded in 1848, at Washington and Jefferson College, Washington. Both societies extended first into the South and then into the West, with the occasional establishment of chapters in Eastern colleges. Miami also witnessed the founding of Sigma Chi (62), in 1855, the last of the " Miami Triad," which extended widely in the West and East. Its Southern chapters established before 1864 were all killed by the war, those at the universities of Virginia and Mississippi being later reëstablished.

The fraternities founded in the South include Sigma Alpha Epsilon (72), University of Alabama, 1856; Kappa Alpha (51) (not connected with the Northern fraternity of the same name), Washington and Lee University, Lexington, Va., 1865; and Delta Tau Delta (52), Bethany College, Bethany, W.Va., 1867. The early extension was limited chiefly to the South, and it is in this section and in the West that the fraternity has most strength. Delta Tau Delta amalgamated with the Southern society called " Rainbow " in 1886, a fraternity which had at the time four active and eight inactive chapters. Kappa Alpha (Southern) has placed its chapters in Southern colleges, with the exception of those in Leland Stanford University and the University of California. Its chapters consequently include a number of inconspicuous colleges, but it has an admittedly high character of membership.

In 1854 members of the Kenyon chapter of Delta Kappa Epsilon erected a log cabin at a cost of fifty dollars, carefully plastering the wall with mud and equipping it with a stove and other utensils necessary for undergraduate revelry. This hut was the first chapter house. In the eighties the movement to build chapter houses became widespread, and to-day colleges have chapter houses of beauty, and in many cases of considerable value. At Columbia, for instance, the lodgeroom of the Delta Psi fraternity is furnished with carvings brought from Egypt. Memorial windows and gifts are not uncommon. No exact calculation is possible of the value of real estate held by the fraternities, but it probably exceeds four million dollars.

The feature of the college fraternities most strenuously opposed in the days when the system was on trial, their secrecy, is now generally agreed to be of small importance, and is usually characterized as amounting to little more than an insistence upon something similar to the privacy of home. To be sure, the fraternities, with the exception of Delta Upsilon, insist upon a system of passwords, more or less elaborate rituals, grips, and the like, but this side of the fraternity has practically ceased to be opposed. It probably has some effect in strengthening the bond between members, especially undergraduates. But it is far from being an essential characteristic.

The fraternities mentioned by no means exhaust the number of fraternities that are national in scope. The complete list, as given in Baird's *Manual of American College Fraternities* for 1905, numbers thirty-one national fraternities, besides seventeen sororities, or women's " fraternities," seventy men's " local " and forty-seven women's " local " societies, and as many as fifty " professional " fraternities, confining membership to students in schools of law, medicine, dentistry, music, or agriculture.

In addition to the societies already referred to, the following general fraternities with the date of their foundation and the number of active chapters may be mentioned: Alpha Chi Rho, 1895 (11); Alpha Sigma Phi, 1845 (8); Alpha Tau Omega 1865 (60); Delta Sigma Phi, 1901 (6); Kappa Sigma, 1869 (77); Phi Kappa Sigma, 1850 (26); Phi Sigma Kappa, 1873 (23); Pi Kappa Alpha, 1868 (28); Sigma Nu, 1869 (65); Sigma Phi Epsilon, 1901 (28); Sigma Pi, 1897 (5); Theta Chi, 1856 (6); Theta Xi, 1864 (13). For the club systems at Harvard, Princeton, and Yale, see the accounts of these colleges.

C. G.

Sororities. — Since fraternities arose largely by imitation, it is not surprising to find that similar organizations among women, sororities, began in coeducational institutions very shortly after the admission of women. The Greek names were, however, a late addition. Probably the earliest women's secret society was the Adelphean, established at Wesleyan College, Macon, Ga., in 1851, followed soon after by the Philomothean, 1852; the former became the Alpha Delta Phi in 1903, the latter Phi Mu in 1904. The first Greek letter sorority was the Chi Theta Delta, instituted at Troy Female Seminary in 1856 by chapters from the fraternity Theta Delta Chi. The Kappa Sigma was established at Elmira in 1856, and, unlike many other sororities, has had an unbroken existence since then; this was followed in 1886 by Phi Mu. The first national organization was the I. C. Sorosis, since 1885 Pi Beta Phi (43), founded at Monmouth College in 1867. The first Greek letter sorority was founded at De Pauw University in 1870, Kappa Alpha Theta (54). In the next few years a large number of Greek letter organizations followed: Kappa Kappa Gamma (35), at Monmouth College, 1870; Alpha Phi (35), 1872; and Gamma Phi Beta (14), 1874, at Syracuse University; Sigma Kappa (10), at Colby College (1874); Phi Sigma and Zeta Alpha at Wellesley College (1876). While many sororities were local only, many established chapters, most of which do not date back before 1880, while the greatest development has taken place in the last decade. There has been a strong tendency since 1906 for the better organizations to drop chapters which are not located in institutions of collegiate rank, and it has thus become more and more difficult for local societies to become affiliated in national sororities, which are those with five chapters or more. The government of the sororities is in the hands of the National Convention, which meets annually or biennially, while local and immediate questions are decided by the local executive councils, which are responsible to the convention. Chapter houses are not so common with sororities as with fraternities, although the movement to establish these is spreading rapidly, the first having been instituted in 1889 by Alpha Phi at Syracuse.

In addition to the associations already referred to, the following general sororities may be mentioned, with the dates of their foundation and the number of active chapters: Alpha Chi Omega, 1885 (14); Alpha Omicron Pi, 1897 (16); Alpha Chi Delta 1902 (15); Beta Sigma Omicron, 1888, (13); Chi Omega, 1895 (25); Delta Delta Delta, 1888 (33); Delta Gamma, 1872 (19); Kappa Delta, 1897 (14); Sigma Sigma Sigma, 1893 (6); Zeta Tau Alpha, 1898 (12).

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FRATERNITIES, HIGH SCHOOL. — See High School Fraternities.

FRAUNCE, ABRAHAM. — A literary man of the later Elizabethan age, born about 1558–1560. He was a fellow of St. John's College, Cambridge, 1580, and in 1583 a student of Gray's Inn. He was connected with Edmund Spenser, Sir Philip Sidney, and Thomas Watson. From the point of view of the history of education, the importance of Fraunce rests on his *Arcadian Rhetorike*, 1588, and the *Lawiers Logike* of the same year. The former work is illustrated by examples in half a dozen languages, and is preceded by a dedication in all of them, which is characterized by Professor Smith as "a piece of schoolboy conceit." In the same year Fraunce published: *The Lawiers Logike, exemplifying the praecepts of Logike by the practise of the Common Lawe.* In this work Fraunce drew his illustrations from poetical works in French, Latin, and English, as he did in the *Arcadian Rhetorike*, and also from the common laws of England. Fraunce's *Rhetoric* and *Logic* cover much the same ground, and his significance educationally lies in his advocacy of the new views of Ramus, and his application of Ramus' (*q.v.*) methods of illustrations of rhetoric and logic by citations from English poets, and from continental modern poets — thus bringing modern and contemporary authors into direct comparison with the standards of classical writers as literary models in rhetoric and logic. At the same time Fraunce regarded the classical writers as the models for original verse, and himself wrote his poetry in hexameters. (See *Cambridge History Literature*, Vol. IV, p. 131.) For an account of the struggle in the university between Aristotelianism and Ramism, the Preface to the *Lawyers' Logic* is an important historical document. Fraunce also wrote a work on emblems and symbols in Latin (1588).

F. W.

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FREDERICK COLLEGE, FREDERICK, MD. — An institution established in 1763 for the education of boys, and chartered as a college in 1830. Most of the work is preparatory to entrance to college, although the degrees of A.B. and S.B. are conferred by the institution. There is a faculty of nine members.

FREDERICK II, THE GREAT, OF PRUSSIA (1712–1786). — Education formed no small part of the benefits conferred on his country by this truly great monarch. Into the details of his own education under the tyrannical régime prescribed by his father it is not necessary to enter. They have been vividly described by Carlyle, Macaulay, and

Freytag. How far Frederick's views on education were colored by his early experiences it is difficult to say, but that he fell under the influences of the educational thought of the Enlightenment there can be no doubt whatever. Wherever he touches in any degree on the subject, and in his letter *Sur l'Éducation*, written to Baron von Münchausen, he insists on the exercise of judgment, on cultivation of the understanding, on thinking for one's self, on the development of the power of reasoning as the highest aim of education. *Faire bien raisonner*, he demands. Not only intellectual ability, but moral perfection, depends on reason. These principles he considers applicable to the three branches of education, elementary, secondary, and higher. The chief fault which he had to find with the schools of his period was the amount of rote learning, the insistence on memory training, and an absence of independent intellectual activity on the part of the pupils. Early in his reign he turned his attention to elementary education, and by regulations of 1740, 1741, and 1743 dealt with the question of support of schools established in the villages of Prussia. The province of the elementary schools was assigned to the clergy generally and to the Lutheran High Consistory. The real and normal school established by Hecker (*q.v.*) received constant encouragement from the royal patron, who in 1750 ordered that teachers for the schools on the royal domains and administrative villages should be taken from this school, which thus became a center of elementary education as well as of the industry of bee-keeping and the culture of mulberry trees. In 1763 the famous General School Regulations for the Country (*Generallandschulreglement*) were issued, providing for compulsory education between the ages of five and fourteen, for the amount of fees and fines, for the support by landed proprietors and tenants, for the appointment of satisfactory teachers, for textbooks and supervision and examination by the clergy. Although this measure may, in practice, have turned out to be nothing more than a pious wish, it laid the foundation of the Prussian system of state education. In 1765 a supplementary measure, drawn up by Felbiger (*q.v.*), was passed for the Catholic section of the kingdom. At the instigation of the King, school funds were established in Pomerania and the Kurmark. It is true that much of the good work already begun was frustrated by the personal permission of Frederick, given in 1779, to employ veteran soldiers in the schools; but the foundations for a better future had already been laid.

Secondary education also received the attention of the King, whose ideas were put into effect by Von Zedlitz (*q.v.*), whom he appointed chief of the ecclesiastical department and school affairs in 1771, and by such practical men as Meierotto and Gedike (*qq.v.*). Himself lacking a knowledge of the classics, denied him by his august father, he yet emphasized the need of it in the gymnasium, not for its own sake so much as for a basis of approaching the vernacular. The despised vernacular, too, was given a place of honor in his scheme, and with prophetic insight he saw its possibility as a literary instrument. History, especially German, was to be employed to train the judgment and character; religion was to form a basis for morals; but above all reason was to be developed. (*Schreiben von 5 Sept.* 1779, *an den Etats-Minister Freiherrn von Zedlitz* in *Œuvres*, XXVII, Pt. 3, p. 253.) When the Pope issued the bull abolishing the Jesuit Order in 1773, he refused to recognize it in his kingdom, for he felt that, whatever the shortcomings of the Order, the Jesuit schools were the only kind available for his Catholic subjects.

In higher education he encouraged the development of academic freedom at the universities (*q.v.*), and reëstablished with great pomp the *Akademie der Wissenschaften* in Berlin. But his chief interest was in the establishment of an institution where a selected group of young nobles, whom he regarded as the pillars of the country, might be trained for public careers in the army and diplomatic service. His ideal was the Greek ideal of a soldier, statesman, and scholar. After the Seven Years' War he established the *Académie des Nobles*, and drew up the plan of instruction himself (*Instruction pour la Direction de l'Académie des Nobles*). The central aim, again, was to be the formation of judgment which could be turned to any subject; logic, rhetoric, letter writing, history, geography, disputation, philosophy, a knowledge of classical antiquity (through modern works, however), of literature and of the development of civilization were to form the curriculum for the fifteen nobles who were selected for the academy.

In these numerous ways were manifested in an altogether remarkable degree the interest of the " Father of his Country " in the educational advancement of his subjects, which paved the way for the educational leadership which the Prussian kingdom was to hold in a later generation.

See Germany, Education in.

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FREDERICKSBURG COLLEGE, FREDERICKSBURG, VA. — A coeducational institution established in 1893 under the auspices of the General Assembly of the Presbyterian Church. Preparatory, music, and collegiate departments are maintained. The entrance requirements are equivalent to about eight points of high school work. The degrees of A.B. and B.L. are conferred. There is a faculty of eight instructors.

FREE EXERCISES. — See CALISTHENICS.

FREE-HAND DRAWING. — See ART IN THE SCHOOLS; DRAWING; DESIGN.

FREE LECTURE SYSTEM. — See LECTURE SYSTEMS, PUBLIC.

FREE PLAY. — See PLAY.

FREE SCHOOLS. — The true and only meaning of "free school" is that of a school free from tuition fees. This is the definition in Dr. Johnson's *Dictionary*, "Free, without expense, by charity, as a Free School, a school in which learning is given without pay." But since 1865 the currently accepted explanation of the term in educational circles in England has been that it means free in any sense but that, and, for choice, means free from ecclesiastical authority. This wholly unhistorical and untrue explanation was accepted simply on "authority" because put forward by that great classical scholar and producer of classical scholars, Dr. Benjamin Hall Kennedy, headmaster of Shrewsbury School for a generation, 1836–1866. At the time of the Public Schools Commission in 1862 the question was a burning one whether the public schools, all but Winchester specifically, founded as free grammar schools, open to all comers without fees, were not committing a breach of trust in charging fees to their pupils, and whether the poor of the towns of Harrow, Rugby, and Shrewsbury were not being robbed by this imposition in favor of the rich from a distance. Harrow and Rugby were then little more than villages, but Shrewsbury being a town of considerable size, the question assumed its most burning and importunate form there. So Dr. Kennedy wrote a paper, published and practically endorsed by the Commission, in which he asserted or implied, in the first place, that the term Free School was due to Edward VI's numerous foundations of schools under the title of *Libera Schola Grammaticalis Edwardi Sexti* and that *libera* never meant "gratuitous" in classical or medieval Latin, and that it could not mean "gratuitous" in Edward VI's days because all schools were gratuitous; "for of schoolkeeping as a profession no trace is to be found, while in the conventual, chapter, and collegiate schools instruction had always been gratuitous to the poor." He asserted that *libera* meant free from jurisdiction of a superior corporation, and in this case of ecclesiastical corporations. Every one of his dicta can be shown to be absolutely false. First, as to classical Latin, there are three passages in Livy alone (xxx, 17; xxxv, 23; xlii, 6) in which *libera* is used in the sense of free from payment; all referring to the grant of *aedes liberae*, or free lodgings at Rome to foreign ambassadors; while the same author records one of the terms of peace with Antiochus in 189 B.C. as being that the cities of Asia which had been tributary to him were to be "free (*liberae*) and exempt," *i.e.* from payment. It is from this and phrases like this that the medieval meaning of *libertas*, *libera*, and *libere* was derived. The most important sign of subjection to a superior, and the most lucrative, was the payment of tribute, toll, or fees. So *liber homo* was the free man, free of doing service in kind, the *liber burgus* was the free burgh, the *liberi burgenses* or free burgesses of which were free from toll in the borough market, and by virtue of royal charters free throughout the realm. A Liberty (*libertas*) was a district free of toll, as in a charter of 1129, "All those who dwell in the said Liberty, who owe toll to me shall be exempt from all tolls," and as in 1200 when King John "granted the freedom (*libertatem*) of my manor of Estaintot from all manner of customs (*i.e.* customary tolls) and services." The royal free chapels, such as St. George's, Windsor, and St. Stephen's, Westminster, were chapels free from visitation by the bishop and archdeacon, and disputes about their freedom always arose on the question of paying the episcopal or archidiaconal fees for the visitation. So naturally a free school meant a school free of fees. As to schoolkeeping not being a gainful profession and fees not being charged for teaching, there is abundant evidence that precisely the reverse was the case. The archdeacon of Bury St. Edmunds, writing *c.* 1075, gives the most emphatic, because casual, evidence that tuition fees were charged in schools, by telling us that King Canute, when he came to a noted minster or castle, sent there to be brought up at his own expense any boys he found, either freemen or among the cleverer of the poor. If there were no tuition fees, what was the expense? A century later Abbot Sampson, immediately after his promotion, gave a living to a certain Master Walter because his father, when schoolmaster, while Sampson was a poor clerk, granted him admission to the school without any charge, by way of charity. Shortly after, the abbot bought a stone house in Bury town and gave it to the school on condition that four clerks (*i.e.* schoolboys) should be admitted free, "as every scholar whether able or not had before this to pay 1*d.* or 1½*d* twice a year." A few years later, about 1198, he endowed the school with an annuity of £2 a year in gratitude for his own free tuition, that forty poor clerks might be free of all payment of money (*denariorum*) to the master for their instruction. There must still have been a large number of paying scholars, as in 1289 and in succeeding centuries the thunders of the Church were directed against those teaching school in Bury without the endowed grammar schoolmaster's license. There was obviously no reason why they should teach or be objected to for teaching, if none of them got tuition fees from it. Perhaps the most striking proof of schoolmastering being a gainful profession is the complaint to Parliament in 1447 of four London parsons against the monopoly of St. Paul's and the two other schools of London. They urged that "while there had been a great number of grammar schools . . . in divers parts of the realm," they were now decayed, so that children instead flocked to London. "Wherefore it were expedient that in London were a sufficient number of schools and good informers in grammar, and not for the singular avail of two or three persons grievously to hurt the multitude of young persons;" for where there is "grete nombre of lerners and few techers and all the lerners be compelled to go to the same fewe techers, the maisters wax riche in money and the lerners pouere in connyng as experience shewith." Toward the end of the fourteenth century, a movement began of which Winchester College in 1382 was an early example on a large scale for the establishment of schools free for some or all who came to them.

On Oct. 20, 1384, Katherine, Lady Berkeley, widow of Sir Peter Vele, "attentively considering that the purpose of many desiring to be informed in grammar, the foundation of all the liberal arts, is daily frustrated and defeated by poverty and want of means," gave lands at Wotton-under-Edge, Gloucestershire, for building a schoolhouse and maintenance of a master, with two free scholars of the art of grammar, a sort of pupil teachers, to "govern and inform all scholars coming to the same house or school for instruction in this art, without taking anything for his trouble from them or either of them." This the Chantry Commissioners of Henry VIII describe as "the Katheryn Vele Fre Scole" and those of Edward VI "a Free Scole of the foundacion of one Lady Katherine Veele — for a mayster to teach gramer freelye."

That such provision was needed, if the school was to be free, is clear from *Piers Plowman* at this time putting into the mouth of "My Lady Meed" the remark "Men that teach children take of them meed." By ordinances made July 14, 1414, for the Grammar School and Song School, founded on the Palace Green at Durham, by Thomas Langley, Cardinal-Bishop of Durham and ex-Lord Chancellor, two chaplains were "perpetually bound to teach school, one in grammar, the other in song, in the city of Durham, and diligently to teach and instruct all willing to learn or study under them in the said sciences, the poor indeed freely (*gratis*) for the love of God, if they or their parents humbly ask it, but taking from those who themselves, or by their friends, are willing to pay the moderate fees accustomed to be paid in other grammar or song schools." The endowment at first was only £2 a year, so that fees were a necessity, though it was increased to £10 a year in 1440 in virtue of directions contained in the Bishop's will. The Chantry Commissioners of Henry VIII describe this foundation as "two Free Scooles, the one of Grammar and the other of Songe." Yet there was no idea of its being independent of ecclesiastical jurisdiction, for the stipend was paid out of the episcopal revenues, and the bishop appointed the masters. The stipend is still paid to the master of the cathedral grammar school, founded by Henry VIII as part of his new cathedral foundation. In 1437 William de la Pole, Earl of Suffolk, obtained license to found an almshouse at Ewelme, near Oxford. The statutes, in English, made some ten years later, provided a "preste," "to whose office it shall longe . . . to teche and inform childer in the faculty of grammer, provided that all the childer of oure chapelle, of the tenauntes of our lordshyp of Ewelme and of the lordshypes perteyning to the sayde almesse howse . . . *frely* be taught without exaccion of any scolehire."

On Oct. 20, 1440, King Henry VI founded Eton College for twenty-five "poor and indigent scholars to learn grammar" with "one master or teacher in grammar, whose duty it is to teach the said scholars and others whatsoever and whencesoever from our realm of England flocking to the said college in the rudiments of grammar, *gratis*, without the exaction of money or anything." The *gratis* of the King exactly translates the "frely" of the earl.

Gryndours Chantry, or Newland grammar school, in Gloucestershire, was founded under license in mortmain of Feb. 28, 1445–1446, for "an honeste and discrete preste beinge sufficientlye lerned in the arte of gramer to kepe and teche a grammer scole ther *half free* for ever; that is to saie, to take of scolers lernynge grammer 8*d.* the quarter and of other, lernynge lettres, and to rede, 4*d.* the quarter, within a house there called the chauntrie house or scoole house."

The Chantry Commissioners reported in 1546 that the "incumbent and scolemaster . . . is of good lernynge . . . the scole nowe beinge well haunted and furnisshed with scolers, and hathe ben allweyes." The people asked for its continuance, "or els hit shalbe a greate lose and discomoditie to all the countrie thereabouts, for that there is not any other Gramer Schole, free nether otherwise, not by a great distaunce." This case is a crucial one. It shows that the people of 1446 and of 1546 equally thought that a free school meant a school free from tuition fees, that tuition fees were normally paid in grammar schools, and that a half-free school was one at which half the customary rate of tuition fees was paid. In 1472 John Gardiner said, by his will in Latin, " I wish a grammar school to be freely (*libere*) maintained in the towne of Lancaster." He wished it made free. His executors, by an ordinance in English, of Mar. 1, 1500, laid down that the master should be " a professed grammarion, keping a Fre Scole teching and informing the childer unto the most profit, nothing taking therefor."

In 1483 a private act was passed as to Acaster College, near York, which recited that Robert Stillington, Bishop of Bath and Wells, had founded it for a provost and three fellows, who were " 3 dyvers maisters and Informatours, . . . oon of theym to teche grammer another to teche musyk and song, and the third to teche to write and all suche thing as belonged to scrivener craft . . . severally, openly and freely, without exaccion of money or other thyngs of any of their suche scholers and disciples." In like manner, by deed in Latin, Feb. 1, 1482–1483, Thomas Rotherham, Archbishop of York, founded Jesus College at Rotherham, for a provost and three fellows, " the first a doctor of grammar, the second learned in song, and the third for those who did not wish to attain the dignity of the priesthood, learned in the art of writing and accounts, to teach those coming to our college in grammar, song, and writing, without exaction of money or other thing." The Chantry Commissioners of Henry VIII reported them as " three scholemasters to teche all chyldren frely," and speak of " the three fre scoles "; and the Commissioners of Edward VI also mention them as " three scholemasters of free scholes." They were certainly not free of ecclesiastical control; the provost was bound to be a priest, and the archbishop was visitor and appointed him.

On Jan. 25, 1502–1503, Sir John Percyvale, Merchant Taylor and ex-Lord Mayor, by will founded a chantry in Macclesfield, and directed that the " preest shall always kepe a Fre Gramer Scole, techyng there gentilmens' sonnes and other good mennes children of the towne and contre thereabouts." Here is the full phrase forty-five years before Edward VI, and, as the master was also a chantry priest, he was certainly not exempt from ecclesiastical authority.

On Aug. 20, 1515, Hugh Oldham, Bishop of Exeter, ex-Clerk of the Hanaper in Chancery, gave endowments, by a deed in Latin, to provide at Manchester " a fit person able to be a schoolmaster, to freely (*libere*) teach and instruct boys and infants in grammar according to the use and form of grammar now taught in the town of Banbury . . . without anything taking therefore except his salary above limited " — *viz.*, £10 a year. On Nov. 7 following, two of the trustees acknowledged the receipt of £50 from Oldham " towards the foundyng of a free scolle . . . to begin on Monday next after the Epiphany . . . commyng." So here we find the founder himself translating *libere docendum* into " a free school " ; while in another Latin deed of 1523 Lord de la Warr recited that he had granted the mills, which formed the chief part of the endowment, only because it was for a free school, *in usum libere scole*, of Manchester. This school was by no means free from ecclesiastical control, being under the collegiate church of Manchester and other church dignitaries.

At Berkhamsted the inhabitants, in concert with Dr. Incent, a Fellow of All Souls College, Oxford, and Dean of St. Paul's, in 1523–1524 assigned the lands of the Brotherhood of St. John the Baptist, while the dean, like his predecessor, Colet, gave the whole of his paternal inheritance, including a mansion house called " Incent's," in the town, for the support of a school. Fearing the dissolution of brotherhoods, Incent obtained letters patent of Oct. 14, 1541, granting him license to found " one chauntry . . . and also one Free Scole within the towne . . . of one mete man being a scholemaster and one other mete man being an ussher for the teching of children in grammer frely withoute any exaccion or request of money for the teching of the same children, not exceeding the nombre of 144," and to acquire lands up to £40 a year value for its support. The corporate name was " The Master Chapleyn or Chapleyns and Ussher of the Fre Scole and Chauntry of Dean Incent's in Berkhamsteed." So far from the " Fre Scole " meaning freedom from ecclesiastical control, while the King was to appoint the master, the Dean of St. Paul's was to " name the ussher and chapleyns." The Chantry Commissioners of Edward VI reported it " a Fre Scole," but the foundation was declared void. A private act of Parliament, passed in 1549, restored the endowment, excepting some parts sold to pay costs, and reincorporated it as " The Master and Usher of the Free School of King Edward the Sixth in Berkhamstead." The act explained what it meant by " free " by repeating almost verbatim the words of Incent's charter, " for the teaching of the said children to the number aforesaid (144) freely without taking any stipend for the teaching of the same, either of them or of any of their parents or friends." There can hardly be a case which shows more emphatically both that the so-called Edward VI free grammar schools were only his in so far as his name was substituted for that of the original founder, and that they were free in the simple sense of free from tuition fees.

We may add to it that of Stourbridge, where a stipendiary priest " stood charged to teche the pore men's children of the parishe frely," and "hath always used and yet doth use to kepe a scole." The lands of this school were confiscated under the Chantries Act in 1548. But the court which managed the confiscated lands ordered on June 1, 1550, lands of other chantries to be granted "for the free teaching of children within the town," and the legal refoundation, though delayed, was made by letters patent of June 19, 1553, in which the school is called the *Libera Scola Grammaticalis Regis Edwardi Sexti*, or Free Grammar School of King Edward VI, for the instruction of boys and youth in grammar. At Shrewsbury itself it is not known exactly how the school, — which certainly existed there in the early eleventh century when Ordericus Vitalis began his education in it, while in the thirteenth century its master occurs as a Papal delegate, to act as a judge on an appeal to Rome, — was maintained. But it was apparently in connection with one of the collegiate churches in the town. In 1549 the town accounts show £20 paid "for buying a free school (*liberas scolas*) to be kept within the town," and on Feb. 13, 1552 (which Dr. Kennedy inaccurately made 1553), a charter was granted in the same words as at Stourbridge for a *Libera Scola Grammaticalis Regis Edwardi Sexti*. So little was this school free from ecclesiastical control that its statutes were to be made, as usual in the charters of Edward VI and Elizabeth, with the consent of the Bishop of the diocese for the time being. Dr. Kennedy found that under statutes made in 1578 a scale of admission fees was imposed from 10*s*. on the son of a lord down to 4*d*. on the son of a burgess unless he was "not of ability," when he was to be free, he argued that, if a free school meant a gratuitous school the statutes were in contravention of the charter, and therefore *Libera* in the charter did not mean gratuitous. But this is due to not seeing the distinction between tuition fees and entrance fees. At the free school of Manchester (1515) following St. Paul's (1510), the founders themselves imposed admission fees as not being counter to the freedom of the school. So in the free grammar school of Hexham fees were imposed on those outside the parish, to provide for flogging instruments; "the schoolmaster's ferules shall be 4*s*., 1*s*. for every quarter day." At Hertford in 1606 the founder said that the parent of every free scholar "shall pay 2*d*. quarterly for brooms and 12*d*. for the whole winter for fire and candle." A free school meant free teaching, and nothing more. As a free pass to the theater means a free seat only, and does not entitle one to free cloakroom, free program, or free refreshments, so freedom from tuition fees did not include free birching, free books, free fires, free lights, or freedom from admission fees paid for entering a boy's name.

Between twenty and thirty free grammar schools of Edward VI were founded by charter of Edward VI, and some eight under Philip and Mary. They were apparently regarded as successful institutions, since about 120 were founded in the forty-three years of Elizabeth; the great majority, as in previous reigns, being not new foundations, but preëxisting fee schools, made free, revived or reëndowed. The same process went on under James I and up to the end of the seventeenth century. During the Commonwealth (1649–1660) a noticeable change took place in the greater importance given to English grammar and mathematics and writing. But the free school was still in vogue. Even as late as 1726 the Rev. Roger Kay endowed a free grammar school at Bury in Lancashire, free for the youth born in the town and (like Walter of Merton nearly 500 years before) free for his next of kin wherever they lived. By his statutes he expressly explained that while saying the school was free, "this was not to debar the master and usher from that common privilege in all Free Schools of receiving Presents, Benevolences, Gratuities, etc., from the scholars their parents and friends," and "besides the usual cock-penny at Shrovetide," he ordered two days in the year for the free scholars "to present the master with a piece of money." He fixed the amounts of this present at 2*s*. 6*d*. to 5*s*. for the master and 1*s*. to 2*s*. 6*d*. for the usher; and this was besides 2*s*. 6*d*. entrance fee, and 6*d*. a year for repair of the school windows. In 1740 he extended the freedom to all living in the parish, wherever born. This foundation was placed under the tutelage of five parsons *ex officio*, so that ecclesiastical control was not diminished, though the rigor of freedom from tuition fees was clearly being undermined by the practice of voluntary donations, which by custom had become compulsory. At Winchester this custom had prevailed so far that, in spite of the express words of the statutes forbidding any payment, every "pore and needy scholar" paid £10 a year to the headmaster. Though in 1776 the custom was solemnly condemned by the Visitors as a grave scandal, the only result was that words were added to the school bill so that the item appeared as "gratuity, if allowed." At last a tender-conscienced headmaster, Dr. Goddard, in 1834, gave £25,000, the income to be paid to the headmaster in lieu of the gratuities, because "it has been such a distress of conscience to receive the money I am determined no Headmaster in future shall suffer the same."

Oddly enough, while in Queen Anne's time the free schools received a great accession from the foundation of charity schools (in which not only free education, but free clothing, and in many cases free board and lodging, was given), in the great development of elementary schools in the latter part of George III's reign (1780–1820) fees, though only 1*d*. or 2*d*. a week, were imposed.

But meanwhile the free education in the grammar school had become a burden instead of a privilege. When the means of traveling increased, the larger schools, from Winchester and Eton downwards, in which a fairly substantial "gratuity" was imposed by custom for the education and large payments were exacted for boarding, attracted all the richer classes into a few big schools. These began to arrogate to themselves the exclusive title of Public Schools. In the smaller grammar schools fierce contests arose as to the extent of the freedom from tuition fees.

In process of time, as the value of money had fallen, the endowments ample for the single master and usher for purely classical instruction of classes of thirty-five to fifty proved wholly insufficient for teaching the numerous additional subjects, French, English, mathematics, and science, which necessitate numerous masters and small classes; the free school became an impossibility. At the end of the eighteenth century the Court of Chancery met the difficulty by holding that the freedom only extended to the teaching of Latin and Greek, a decision which had the remarkable effect of excluding from the schools the poorer classes who did not want to learn classics and did want to learn the other subjects, especially English and arithmetic, for which fees more or less heavy were imposed. Hence the cry of robbing the poor and breach of trust, for which Dr. Kennedy devised his successful but wholly false answer. The courts never adopted it. But the difficulty which the law courts were unable to solve was met by the establishment by Parliament, from 1862 to 1874, of commissions with legislative powers, the public schools commission, the endowed schools and the charity commissions, which swept away the pretense of free schools, imposed fees of substantial amounts for education, retaining freedom only for a certain number of free scholars, generally from a limited area, selected by competition. After the elementary schools were made free by state intervention, and large powers over schools were given, in 1896 and 1902, to local authorities, a movement for free secondary schools again began. If the State or the locality is prepared to find the necessary funds by grants increasing with the demands of the time and the numbers in the schools, it can of course ensure freedom. But it may have to consider whether the schools which it makes free will attract the pupils it wishes to attract. In the eighteenth and early nineteenth centuries, where the freedom of the schools was successfully upheld by popular pressure and the magnitude of the endowment, the schools soon fell into decadence, as the richer classes deserted them for fee-paying schools, where they could get the variety and teachers they wanted; and the poorer ceased to value what could be had for nothing, where they only met each other, and where there was no real inducement for the teachers to do their best. Whether in the future these difficulties can be overcome remains to be seen. By the Secondary School Regulations (1909) all fee-charging schools, to qualify for the higher government grants, must, among other conditions, offer free places to pupils entering from public elementary schools, the number ordinarily being 25 per cent of the total number of pupils admitted to the school in the previous year. As a result of this measure, and the rise in the cost of maintenance and equipment of secondary schools, fees appear at present to be rising.

A. F. L.

American Usage. — In colonial America the term appears frequently, and has led to various interpretations, as in England. While, as in England, the term has been interpreted by students in a variety of ways, a careful examination of the local records, which are now available in print, indicate that the term "free" was not used in connection with schools except in the sense of free from tuition charges, though such schools were not always under the direct control of nor directly supported by the government. In other words, a free school was not necessarily a public school in the later use of the term. The earliest evidence we have is that of the Boston Latin School, 1635, when it is stated that the richer inhabitants gave "towards the maintenance of a free schoolmaster for the youth with us." A few years later, 1644, at the neighboring town of Dedham, the inhabitants "did with unanimous consent declare by voate their willingness to promote that worke promising to put too their hands to prouide maintenance for a Free Schoole in our said Towne." This was probably an elementary as well as a Latin grammar school. But there is no question but that the term was also used in connection with the elementary school, as is indicated by the following excerpt from the Boston records of 1686. "The same day it was voted by ye inhabitants yt the same Comittee with ye Select men consider of & pvide one or more Free Schooles for the teachinge of Children to write & Cypher within this towne."

In the other colonies the term was often used, but most frequently in connection with the Latin grammar schools. As most of these had endowments of some character, or were supported by contributions, they were usually "free." But even here the use of the term was sometimes ambiguous, as is indicated by the contemporary reference of Beverly, when he states that there were "tracts of land, houses, and other things granted to free schools for the education of children in many parts of the country; and some of these are so large that of themselves they are a handsome maintenance to a master; but the additional allowance which gentlemen give with their sons render them a comfortable subsistence. These schools have been founded by the legacies of well inclined gentlemen. . . . In all other places, where such endowments have not been already made, the people join and build schools for their children, where they may learn on very easy terms." So it is evident the tuition was paid in "free schools," but only by children of wealthy gentlemen. The term "free education" was also somewhat ambiguous, but no doubt it is used here in the sense of "liberal" or higher education. In the statutes of the Southern colonies, relating to the education of orphans, the following phrase occurs repeatedly: "But if the estate be so mean and inconsiderable that it will not reach to a free education, then the orphan is to be bound out to some manual trade till one and twenty years of age," etc.(Virginia, Act II, 7th of Commonwealth, December, 1656). This is substantially as it appears in subsequent acts. Previous to this time, similar enactments use the phrase, "extends not to give them breeding," so that "free education" and "breeding" are evidently used to signify liberal education.

In the early nineteenth century free school becomes synonymous with charity school, and though it was used to avoid the opprobrium of the other term, it has come to have much the same stigma attached to it. Thus in 1805 the "Free School Society" was established in New York City "for the education of such poor children as do not belong or are not provided for by any religious society." But in 1826 the title was changed to "Public School Society," to avoid the opprobrious term and also to permit charging tuition for pupils who were able to pay. But this charge only accentuated the social discrimination, and after the very existence of the society was threatened, all tuition charges were abolished and the schools again became free in 1832, but retained the term "public" in preference to "free." It was ten years more before the city itself took up officially the responsibility for schools, and not until 1853 that the schools of the Public School Society were turned over to the city school board. The discrimination caused by tuition charges survived longer in rural regions than in the city, and were not finally abolished by statute until 1867, after an agitation of three or four decades of free schools. In some states the final establishment of "free" schools, as contrasted with public schools, did not occur until after this date, and in general, outside of New England, this stage of compulsory freedom from tuition charges was not reached until after the Civil War period.

See, for details, the articles on the various states of the American Union; and on the educational system of the various countries; also, Cost of Education; Colonial Period in American Education; Fees; Public Schools.

P. M.

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FREE SCHOOLS, SUPERINTENDENT OF. — See Superintendent of Schools.

FREE TEXTBOOKS. — See Textbooks, Free.

FREE TRANSLATION. — See Latin, Methods of Teaching; Modern Languages in the School.

FREEDMEN'S BUREAU. — A section of the War Department established at the time of the Civil War in the United States, to deal with the different phases of the negro problem which then cropped up. A Bureau of Emancipation was proposed in Congress in 1863, but failed to be enacted; in the same year a committee of inquiry suggested a temporary bureau "for the improvement, protection, and employment of refugee freedmen." A bill passed by Congress in 1864 for the establishment of a Bureau of Freedmen in the War Department came to nothing, but in Feburary, 1865, a bill for the establishment of a Bureau of Refugees, Freedmen, and Abandoned Lands was passed, and this was placed under the War Department. It was to be maintained throughout the war and one year thereafter, and was to have "the supervision of and management of all subjects relating to refugees and freedmen." In 1866 its powers were more fully defined and extended. The work was placed in charge of a chief commissioner, General Oliver O. Howard (*q.v.*), with power to appoint assistant commissioners in different districts. One of the chief objects of the Bureau was the establishment of schools, and one of the earliest acts was the introduction of school teachers from the North. By the extended powers granted in 1866, Confederate public property could be sold and used for educational purposes. The general work of the Bureau came to an end in 1869; but the educational work was carried on beyond that date. The Bureau coöperated largely with benevolent associations, and so far as was possible encouraged support of colored schools by the freedmen themselves. State superintendents of education were appointed. The *Ninth Semi-Annual Report on Schools for Freedmen,* issued in 1870 by the General Superintendent of Schools of the Bureau, J. W. Alvord, gives the following figures on the progress of education of the colored people. There were 2677 day and night schools, with 3300 teachers (of whom nearly 1800 were colored), and 149,581 pupils in attendance. The freedmen maintained wholly or in part 1324 of the day and night schools, and owned 592 school buildings. The average attendance of pupils was 78 per cent; $61,513.03 was paid in tuition by the freedmen, who also paid a large proportion of teachers' salaries. Thirty-eight high schools, with 3834 pupils, were in operation, and of these, eleven were colleges and universities; there were in addition thirty-three industrial schools, with an attendance of 776 pupils. During the five years of its work, the Bureau spent $6,513,955.55, of which a considerable part went to educational purposes. $750,000 of this sum came from the freedmen themselves. The Bureau thus helped to give the negro opportunity for free education, and also familiarized the South with a system of public elementary education. In addition, the institutions for higher learning, if they did not receive material support, at any rate had the full encouragement of the Bureau, and it was at this period that Atlanta, Fisk, and Howard Universities and Hampton Institute were established.

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FREEDOM, ACADEMIC. — The freedom to teach in higher institutions of learning well-thought-out principles and demonstrated truth, or to direct the search for these without the interference of political, bureaucratic, or religious authority. In recent times restrictions upon this freedom more frequently arise through limitations placed upon the individual instructor by the administrative authorities of the university or college itself. In its origin the right was simply that of " internal jurisdiction " granted by Pope or monarch. (See Universities.) In modern times the right and the problems connected with its maintenance have assumed quite different forms.

In the main, the question of academic freedom falls within the struggle for freedom and thought, *i.e.* of scientific inquiry. In part, it belongs to the political struggle for the right to free speech and publication, a movement more closely connected with the scientific struggle, however, than is usually recognized. If ideas and scientific information were so abstract and impersonal as to have no bearing upon social practice, or if social institutions were so plastic and flexible as to respond easily to every intellectual change, freedom of thought and expression would not have to be bought at a great price. But since social life rests upon a body of customs, or *mores*, which have great inertia and which tend to persist simply because they have existed, and which resist change, the innovator, the inventor, the reformer, the prophet of change have been regarded with suspicion and dislike. Moreover, ideas which, in their origin, were quite theoretical or purely intellectual, become a part of men's general intellectual attitude, and share in the ossification characteristic of habit. Thus astronomical and geographical ideas that, taken by themselves, had no direct moral or social meaning, became so fused with mankind's religious and moral conceptions that at the Renaissance the changes of belief incident to a progress of those sciences seemed to many like an attack upon the foundation of the fundamental moral and religious convictions of mankind. The same situation recurred, though with less intensity, in the sciences of life upon the promulgation of the Darwinian theories. Since schools and colleges are social institutions, supported directly and indirectly at public expense and appealing to the general public for students, features of the general conflict are inevitably reflected in them.

By the nature of the case, disputes regarding infringement of the liberty of the teacher to teach or discuss doctrines hostile to the customary beliefs of the community arise in subjects and parts of subjects that are scientifically novel. This means that scientific opinion is divided; or, if the new doctrine is one of great importance, that the weight of scientific authority is hostile. Then the academic institution can allege that the objectionable doctrine is not sufficiently well established to justify its classroom promulgation. In such cases, it is claimed that the teacher who introduces it is not using his right to liberty of intellectual thought and expression, but is rather engaged in a propaganda of his private opinions. Barring the cases (more often found in America than elsewhere) of supposed interference by a founder or large benefactor in matters where he happens to have strong personal interests, it will be found, accordingly, that the question of violation of academic freedom comes up in sciences and topics that are in a condition of formation or rapid transition — as the historic portion of this article demonstrates. One can hardly conceive the question now arising in those portions of mathematics, physics, chemistry, etc., that are generally recognized to be established.

Regarding questions that fall within the debatable middle grounds (questions with a bearing upon economic, political, moral, or religious practice and belief) the following principles may be laid down. (1) There is a marked difference between institutions which lay claim to a genuine university or scientific status, and those which exist for the sake of upholding a set of tenets agreeable to a certain class. What would be a violation of academic freedom in the former case is not necessarily so in the latter. But it should be made clear that the latter type of institution does not claim to exist for the discovery and teaching of truth impartially, but for the propaganda of certain doctrines — an admission that few institutions at present are willing to make about themselves. (2) The relative maturity of the students is a point of obvious moment. Certain discussions that would be perfectly proper, that indeed are educationally indispensable, with students of a certain degree of progress might be unadvisable with younger pupils. The attempt to make a fixed line of demarcation between colleges that are simply teaching institutions and those that make a point of research is not, however, justified. The results and spirit of research are such a general part of the intellectual life of the present day that an institution which made such a distinction a criterion of what was allowable and unallowable in the classroom would confess to a dogmatic and unscientific trend. (3) There is an obvious difference between teaching as final what is still under discussion among scientific men themselves, and presenting the same matter impartially to students, though with a definite indication of what the instructor's own views are. An institution that even indirectly discourages the latter course on disputed economic and sociological points virtually surrenders its claim to be conducted in the spirit of a university, whose mark is love of truth. Even the expression of individual opinion on matters beyond the possibility of immediate scientific settlement is better than an atmosphere which restricts presentation to the conventionally settled aspects of a subject. As a matter of fact, where free discussion is permitted, the student is pretty sure to come into contact with varying views upon a topic so that the danger of being misled by a one-sided presentation of a matter is much less than it seems. This mutual offsetting and supplementing of erroneous ideas by one another has been proved in political experience to be an adequate ground for permitting free speech and publication, and the same reason applies to education with little qualification. Much of the popular misapprehension as to the " danger " of free discussion of such topics as, say, socialism in college classrooms, arises from failure to realize the extent to which an atmosphere of free discussion carries with it its own protection against unbalanced propagandism. (4) Experience shows that in the present state of things the menace to academic freedom is indirect rather than direct. That is to say, there is little likelihood that any trained independent thinker will have his ideas suppressed. But American colleges have undergone a very rapid expansion, demanding great increase in material resources; the proper equipment of library, laboratories, museums, etc., being very expensive. This has led both to an aggrandizement of administrative authority and to a direct dependence upon the wealthy men from whom the necessary endowment must be obtained. Since teachers are usually animated by a strong professional loyalty and *esprit du corps*, the situation has a tendency to make them avoid teaching or expressing views which might alienate the class of persons upon whom the development of the institution most obviously depends. An insecure tenure of office and uncertain economic status operate in the same direction. The chief safeguards against these dangers are the increase of the scientific spirit of impartial inquiry and the growing solidarity of teachers and thinkers in different institutions. So far as the consensus of scientific equals is substituted for the irresponsible action of administrative superiors as the final court of appeal, there is little danger of either exploitation of personal opinions or of infringement upon that intellectual liberty which is the essence of university life. J. D.

Germany. — In the sense that the limitations under the uniform control of scholasticism and catholicism were so strong that attempts to go beyond them were rare, the German Universities of the Middle Ages enjoyed considerable *Lehrfreiheit*. Aside from these general ecclesiastical and scholastic limitations, there was no prescription as to what should be taught, the maxim being *quisquis praesumitur bonus*. The Reformation, however, brought with it a great change in the attitude toward education, and particularly to the universities. Both now came to be regarded as instruments of control. At the universities were educated the future clergy and state officials; hence certain religious tenets must be rigorously taught and observed there. The aim of each petty ruler now became to secure the control of a university in his state. Hence the foundation or reorganization of numerous universities in Germany during this period. Not only were new arrivals and candidates for academic offices questioned on doctrinal matters, but restrictions were imposed on the attendance of the members of a state at universities outside that state. Not only were the subjects which should be taught prescribed, but their extent and nature was limited. Thus at Wittenberg there was a provision for the teaching only of the Augsburg confession under penalty for breach. At Marburg the following provision was included in the Charter: " Whoso teaches contrary to the word of God, let him be accursed." Church attendance was insisted upon at most universities, and at Königsberg attendance at least at one theological lecture was prescribed for all members. Melanchthon's activity in the founding or reconstitution of the universities was marked by the uniform regulations found in so many universities in Germany at that time. " Science " (including under that term theology, jurisprudence, medicine, language, and the liberal arts) was to be " taught according to the word of God." Denominational universities arose as bulwarks against heresy. Professors were appointed and paid by the states; the examination and graduation of students were under the supervision of the governments. Undoubtedly the Reformation checked the spread of the Humanistic tendencies, and in education, at any rate, introduced a reaction, which was not broken down for two centuries. At the end of the seventeenth century opposition to the scholastic and religious restrictions at the universities began to make itself felt. Christian Thomasius (*q.v.*) was compelled to leave Leipzig because he attacked the principles of the Court and insisted on using German in his lecture. Spener (*q.v.*) was driven from Leipzig and Wittenberg for his Pietistic tendencies. Francke (*q.v.*) in the same way incurred the opposition of the official theologians. These and others found safety under the protection of the Court of Brandenburg, which now sought to establish its importance through a state university founded on liberal principles. This led to the foundation of the University of Halle in 1694, to be open to members of all denominations. Here Thomasius lectured in German, Francke spread the principles of Pietism, and Christian Wolf (*q.v.*) broke down the scholastic philosophy by his pronounced rationalism, which found expression in his *Vernünftige Gedanken.* Gradually the sciences were secularized; natural law was made the basis of jurisprudence; the subjectivity of belief was insisted upon. In 1734 the University of Göttingen was founded entirely on the principles of academic freedom. Genuine scientific research was permitted and encouraged, and every faculty enjoyed a similar freedom. It was a sign of the times that, only thirty years after the expulsion of Thomasius, the University of Leipzig permitted Gottsched to lecture on Wolfian philosophy and German poetry. Since that period the German universities have enjoyed the freedom, which was then won, without disturbance. The strength of the universities was considerably increased at the beginning of the last century by the rise of the *Burschenschaften* (*q.v.*) The foundation of the University of Berlin and the appointment of Wilhelm von Humboldt (*q.v.*) were an embodiment of the traditions which had been established. The *Aufklärung* had its most numerous adherents in the universities. When the Revolution of 1848 took place, the King of Prussia, Frederick William II, and his supporters attributed it to the exaggerated worship of the cultivation of the mind instead of the heart due to the *Aufklärung.* Their attitude was well illustrated by the attacks and restrictions placed on the gymnasiums and normal schools. But the universities were now too strong and remained immune against any governmental interference. Not only have the universities grown in academic freedom, but politically they are the most democratic bodies in Germany. Several attempts, all of them ineffectual, have been made to limit this freedom, and when the Prussian ministry decided in a recent case that membership of the social-democratic party was sufficient reason for exclusion from the position of a university lecturer, the whole of the faculty of the university concerned rose in opposition to this decision. The only restriction which can be exercised, is indirect through the method of appointment to the chairs and by the requirements for state examinations. Even in theology the government has refused to allow any limitations or control, which the church authorities are demanding. The most unrestricted members of the universities are the Privat Docents (*q.v.*), who are not state officials, and are permitted to lecture by the faculty. " Science and the teaching of science are free " in the German universities, possibly more free than was the intention of those who framed the Prussian Constitution of 1850.

England. — The English universities of Oxford and Cambridge asserted their independence of Papal control at a very early period. The views expressed by William of Occam (*q.v.*) against the authority of the Pope gained a ready hearing at Oxford, and in 1368 the university obtained its independence from the Papal representative, the Bishop of Lincoln, in the election of the Chancellor. Cambridge similarly became independent of the Bishop of Ely in 1430. On the whole, however, the universities were the seats of orthodoxy, as was instanced by the persecution of Wyclif and the Lollards and the still earlier neglect of Roger Bacon. The political importance of the universities was emphasized during the Reformation, but they did not serve as easy tools of the monarchs in the same way as the German universities. Henry VIII found a considerable amount of independent thought on the divorce question, which he referred to Oxford and Cambridge, and only obtained a judgment which was satisfactory to him by the exclusion of members from convocation. The Reformation was introduced in the universities, not without a struggle, as was testified by the number of academic adherents to Catholicism when Mary came to the throne. The Edwardine Commission had had an important influence on the studies of the universities by abolishing the study of canon law. The result of the legislation of the sixteenth century was to introduce the imposition of tests on students, fellows, and heads of colleges at both universities. The ecclesiastical influence continued to increase in the next century, when Laud reimposed tests, insisted on attendance at university sermons, and reinforced the licensing of teachers by clerical authority. By the Caroline Statutes (1636) it became the duty of the Vice-Chancellor to safeguard the orthodoxy of the pulpit. The traditions established at this period continued until the middle of the last century and established the universities as instruments of the Anglican Church. Politically the effect was the same, as was illustrated by the Tory ascendency at the universities during the eighteenth century, in spite of the interference with their liberties by James II, who attempted to secure the selection of some Romanists to fellowships and masterships of colleges at Oxford and Cambridge. The effect of the imposition of religious tests and subscriptions was to exclude dissenters from the universities for nearly three centuries; there were tests on matriculation, on proceeding to degrees, on election to fellowships and headships of colleges. Under such circumstances the universities became close corporations, and academic freedom was recognized within the limits which they established. The effect of the tests was to lead to the establishment in 1825 of the University of London, followed a few years later by the northern colleges. In 1854 all oaths and declarations at matriculation and on taking the degrees of Bachelor of Arts, Law, or Medicine, were abolished at Oxford, and in 1856 at Cambridge for all degrees except in Divinity; further tests were removed in 1871, and since 1882 there are no tests for fellowships. At present there are no religious restrictions in any English universities, with the exception of those for professors of theology at Oxford and Cambridge. Otherwise academic freedom is complete throughout the country, especially since the newer universities were established as a protest against the restrictions of the older. The rule which holds at Oxford for professors, " He may lecture in such manner and form as he judges to be best for the instruction of students and the advancement of knowledge," has general validity. Such restrictions as are still found at the older universities are of a kind which prevent progress and adaptability to modern requirements, but are due to the peculiar nature of their constitutions, which retain for the universities the character of a close self-perpetuating corporation.

See Cambridge, University of; Oxford, University of.

France. — In the university of Napoleon the faculties took the place of the old special schools, and were designed not for free scientific research, but for the preparation for and the conferment of degrees. They were entirely subordinated to the central authority, which regulated the use of their appropriations, the nature and subject of this instruction, nominated the professors and other teachers and employees. The syllabus of courses was submitted each year for the approval of the Minister.

The faculties at present still insist on the passing of examinations and prepare for certain examinations (licentiates, certificates, etc., or competitive tests (*agrégations*, inspectorates, etc.); but they have a very considerable, if not absolute, scientific and financial autonomy, since the transformation of the groups of faculties in universities. This change has been demanded ever since the ordinance of 1814, which proposed the establishment of several local universities, and was sketched in Guizot's (*q.v.*) plan for the organization of large centers for study and outlined in the projects of V. Duruy (*q.v.*) and J. Simon (*q.v.*). Under the direction of M. Liard the change was realized in its broad lines by the decree of Minister Goblet (Dec. 28, 1885) and the laws of April 28, 1893, and July 10, 1896, which created " each faculty, then natural groups out of them, like living organizations with their own life and a soul, truly individual " (L. Liard). Established in this way, the French universities differ from those in England, which receive little from the State and can ask nothing from it, and much more from the German universities, which, even though electing their rectors with full liberty are still under the strict control of the State in the use of appropriations and the nomination of the professors. An attempt to secure this organization had been made at the time of the establishment by V. Duruy of the *Ecole pratique des hautes Etudes*, in which the instructors were free to select the subjects of research or instruction.

The present situation is as follows: (1) The group of faculties in each capital of an academy is under the direction of the Council of the University nominated by the professors and presided over by the Rector, as the deputy of the Minister. The council is a civil person, implying the power to receive and acquire by way of gifts or legacies, or subsidies from towns, departments, or individuals, sums which with the state appropriations constitute the budget proper. (2) Each group, having itself become autonomous, is called a university, in which the different faculties can themselves decide on their courses, on condition that these offer a suitable preparation for the degrees or competitive examinations; can create or change some chairs; can introduce new studies to meet the needs of their district (*e.g.* local history, provincial dialects, local industries); and can deliberate on the use of their budget, etc. (3) Each university has full disciplinary power over its officers and students; and may present candidates to vacant chairs; the Dean may appoint persons for certain services.

In short in the present system, " instead of compelling the faculties to put its ideas into operation, the central administration assumed the task of putting into practice those which come from the faculties or have their approval " (L. Liard). The universities thus find themselves situated between the influence of the state administration and political and social influences of their own local center and their conception of their scientific function. This conception they realize in proportion to the scientific standing and personality of their professors. J. P.

United States. — The problems connected with the right of academic freedom in the American colleges and universities divide chronologically into three quite well defined groups or periods.

The first of these periods includes the

seventeenth and eighteenth century, wherein the authority threatening this freedom is ecclesiastical, and the interests supposedly threatened are sectarian. The first president of Harvard afforded the earliest instance. President Dunster was " persuaded to resign " in 1654, after fourteen years of most valuable service, because of anti-pædobaptist beliefs. The second president, Chauncey, had suffered suspension from the ministry and imprisonment in England for exercising the right of free speech as a minister, but his orthodoxy was unquestioned in New England, especially in the doctrines in which Dunster was weak; "it being his judgment not only to admit infants to baptism, but to wash or dip them all over." The next difficulty in this respect at Harvard was in the early eighteenth century, when there was a prolonged struggle for control between the orthodox Congregational party and the aristocratic Church of England element, holding more tolerant religious views. While numerous restrictive acts were in the nature of limitations of freedom of belief and of teaching, yet such acts were but incidental to profound social and religious struggles. The early years at Yale also present instances of arbitrary restriction of the liberty of belief and of teaching. Yale had been but three years at its permanent site when trouble of this character arose with the first New Haven president. The breach occurred over so trivial a matter as the President's crying with raised hands at the close of the commencement services, " Let all the people say amen." This, however, presaged President Cutler's fall from office and his apostacy to episcopacy. Theological tests for all faculty members then were adopted, which remained until the nineteenth century. While students were at times expelled for religious indiscretions, such as attending services at churches other than the orthodox one, or petitioning to use Locke's *Essay on Toleration*, the test preserved the faculty from such infection. Most of the colonial colleges afford similar illustrations. The prolonged struggle at William and Mary, led by Thomas Jefferson, was a revolt against this restriction by ecclesiastical authority. Early in the nineteenth century, Jefferson gave up the attempt to free William and Mary from such control, and turned his attention to the founding of a new institution, — a state university, which, however, did not eventuate until the first quarter of the century was rounding out.

It will be noted that the restriction in nearly every instance was upon the freedom of belief in theological dogmas or practices by those in academic authority. Before the close of the eighteenth century Harvard had made long strides towards throwing off this incubus. At Yale, after a prolonged struggle involving the right of the student as well as of the teacher to hold religious beliefs heterodox to the authorities, the state government succeeded in forcing *ex officio* representation on the board of trustees and a more liberal attitude regarding religious beliefs. Somewhat later the same difficulty was settled at Princeton by the organization of a theological seminary distinct from the college (1812).

The second period into which higher education in America may be divided, with respect to these problems, includes in a general way most of the nineteenth century. Instances involving infringement of academic freedom now arise chiefly out of the subject matter taught or ideas advocated, which involve a digression from religious views common to all Christian sects. Attempts to prevent such digressions now give rise to direct restrictions upon the liberty to teach freely the principles or data of a novel subject. Such cases arose immediately after the Revolution in connection with the French language and literature. These were supposed to be full of heretical suggestion, chiefly, no doubt, because many of the early teachers were " free thinkers." At Harvard in 1780 French was offered to those who obtained consent of parents or guardians. Eight years later a course on natural history was opened on the same terms. Thus was inaugurated the suspect period in science, which was to continue for almost a century.

Later, in the nineteenth century, novel geological and astronomical ideas occasioned a more eminent danger. But it was with the general formulation of the evolutionary theory by Spencer and Darwin that conditions became acute. The colleges of the nineteenth century were mostly denominational. Harvard's apostacy from Congregationalism, the Dartmouth College decision which protected religious bodies in the control of institutions founded by them and chartered by legislature, the failure of Jefferson's long struggle over William and Mary, and the numerous foundations of state universities, gave an unprecedented impetus to the founding of institutions of learning, especially in the more newly settled states. These were avowedly denominational in control and character; and while few were sectarian in teaching, all emphasized very strongly the religious character and importance of education. As such institutions attempted to keep abreast of rapidly advancing formulation of scientific principles, numerous instances arose of conflict between the right of an instructor to teach views for the time being held heterodox to many denominations or to Christian bodies in general. Hardly a college of the several hundred now existing but what furnished one or more illustrations of this situation. However, many influences have been at work to make the acceptânce of the scientific views, heterodox to the middle nineteenth century, a matter of convention now; to adjust those views to religious conceptions acceptable to the present generation; and also to weaken the religious or at least denominational affiliation of many of the colleges. Instances of loss of professional position because of such views probably occur yet; but they are rare, and do not entail the hardship upon the offending instructor they once did. So much of the injury resulting is to the offending institution that the offense is scarcely to be noted as one against academic freedom.

But within the present generation, a new era has been entered, and an entirely new kind of academic danger has arisen, through restriction of freedom of teaching. Problems of this character now arising relate to economic or social doctrine. The restriction arises chiefly because the control of our higher institutions of learning has passed to representatives of the secular as opposed to the ecclesiastical world. As one of the most serious forms of the "commercializing" of education and of culture, this situation is all the more dangerous because often not recognized by those immediately responsible for the violation of a fundamental social right, or even by those through whom the restriction arises. The situation is due partly to the enormous expansion of philanthropic gifts to education, partly to the participation of successful business men in collegiate control, — a feature which has been largely responsible for the progressive character of American education, — and partly the recent emergence of a vast number of social problems of fundamental human interest and importance. The most subtle and most common form in which this academic danger exists is where an institution has the friendship and patronage of a liberal donor, whose beliefs and prejudices must be respected even to the extent of avoiding consideration of certain subjects, the severance or termination of relations with certain instructors, or even the presentation of specific views on given subjects held by the patron. The administrative authorities of many educational institutions at the present time confess this as a real danger. It is less the limitation on academic freedom arising from gifts already made, than the restriction arising from desire to avoid offense where greater favors are desired and anticipated. The present generation has witnessed a number of instances where the favor of a living benefactor has been more fraught with danger than the traditional "dead hand." In order to avoid such contingencies one of the most generous of such patrons has wisely indicated to the favored institution that he has made his last gift, and has severed all relations with the institutions which he founded. The cases of violation of the right of free teaching, however, are not by any means confined to institutions having a special patron, but occur in all types of institutions, — one of the most flagrant of recent cases being in a state university.

During the past two decades a number of notable instances have occurred of the severing of academic relations because of the economic or social views held and doctrines taught by the instructor involved. In one of these instances, the president of an old and honored New England university was concerned. The monetary problem, state control of railways and of other services, municipal control of such services, public concessions of questionable character, or even more general socialistic teachings, have been the occasion for the half dozen more prominent of these instances. It is but just to say that in almost every case there have been involved factors other than the orthodoxy of the economic doctrines involved. Methods of propaganda, traits of personality, local factional influences have entered into almost every case, so that justice cannot decide with precision. For the present it is not overt cases of this character which present the most serious danger to the right of free teaching and investigation, but the more subtle types indicated above. A few cases arising out of political partisan bias form a class by themselves; but such instances are rare, and are not apt to recur except in marked isolation. For related topics see LITERARY CENSORSHIP; and under COLLEGES, AMERICAN, the section on Administration of the Curriculum, for discussion of freedom of study.

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FREEDOM OF PRESS. — See LITERARY CENSORSHIP.

FREEDOM OF PUBLICATION. — See LITERARY CENSORSHIP.

FREEDOM OF WILL. — In certain of its aspects, the problem of freedom of will has become so encumbered with the refuse and débris of all kinds of other matters as to be best "solved" by letting alone. Some of these extraneous affairs are the divine government of the world, and the accompanying questions of foreknowledge and foreordination; the notions of cosmic fate or necessity, or, in mitigated form, the fixed law and physical causation; the legal and forensic questions of guilt, liability, and punishment, etc. Moreover, the psychological analysis is hampered by diverse and unsettled notions as to the nature of the self, and the nature of volition itself, especially in relation to emotion and reflection. Fortunately none of these difficulties seriously affect educational questions, while in those concrete matters with which education is concerned there is a general consensus of belief.

1. Freedom of will in the sense of motiveless choice is, even if it exists, of no importance for education, which is concerned with the formation of a character interested in ends that are valuable, and interested in a way that makes these ends stable and effective motives. Or, we can go farther, and say that such freedom, even if it exists, is of negative value to the educator; that is, it introduces a factor of arbitrariness, of caprice, of whimsical unaccountableness, that would be such an undesirable element of character that one of the aims of education would be to counteract it. The supposition that unmotived choice would be of any positive worth is due to a false conception of motive; that is, to regarding it as a force which acts from without upon the self, as if the latter were passive or idle until externally appealed to. Since, however, the self is active on its own account (see EXPERIENCE; FUNCTION); a motive has its origin and residence within the self, so that in acting in accord with motive it may still be expressing its own nature.

2. Plasticity, tendency to variation, to growth, to readjustment of habit, are also native to the self. This covers a large part of the practical meaning of "free will," viz. power to reform, to develop, to alter unfavorable tendencies, and to take on new and better habits. Absence of freedom suggests a rigid domination from without which is fatal to growth and reconstruction from within; while, as a matter of fact, it is only in cases so extreme as to be pathological that initiative and plasticity cease.

3. Preference, selective activity in a specific direction, is also a concrete trait of human action. It has been said that the chief defect of both the conventional upholders and opponents of freedom is that they try to get behind the fact of preference; the opponents, by denying it or reducing it to an illusion; the upholders, by regarding it not as a self-sufficing fact, but something to be accounted for by reference to a faculty which is its cause. Once recognize that all organic activity is partial, preferential, interested in some special direction or toward some end, and we have included a significant element of freedom, practically unordered.

4. Reflection presents and weighs alternatives. A thinking being is free in a sense in which no unthinking being could be free, even if fully endowed with "free will." For a reflecting agent can present to himself the consequences of a proposed act; he does not have to wait till the consequences are externally and irretrievably produced to see whether they are desirable or undesirable. If on reflection, the consequences are seen to be adverse, the proposed line of action, if dropped for preference or the bent of disposition, is shifted to some other alternative, which is then weighed. Just in the degree in which one is gifted with the habit of reflection, in that degree he is capable of acting in the light for a foreseen future instead of being pushed from behind by sheer instinct or habit.

With respect to freedom, then, the task of the educator is threefold. First, to keep alive plasticity, initiative, capacity to vary; to prevent induration and fixation in fossilized automatic habits. Even a thoroughly good habit needs to be kept flexible, so that it may be adapted, when the need arises, to circumstances not previously experienced even by way of anticipation. Secondly, to confirm preferences; to build up and strengthen positive and constructive interests in specific directions. Nothing is more fatal practically than the growth of a spirit of indifference, of boredom, or of miscellaneous and easily diverted responsiveness. Thirdly, to make preferences *reasonable;* that is to say, to develop in individuals the habit of forecasting the consequences of acting upon a given preferential tendency, of comparing one set of results with another, and by these means enlightening preference as its own deeper and more abiding nature. Capacity transforms habit when required. Steady and specific interests, foresight, and deliberation, — given these factors of character, and purely speculative difficulties in the concept of freedom may be left serenely alone. J. D.

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FREEMAN, ALICE. — See PALMER, ALICE FREEMAN.

FREIBERG, SAXONY, ROYAL SCHOOL OF MINES. — Established 1765 and opened in 1766. Freiberg has the distinction of being the first, and, for a time, the only technical university in the world. It was the pioneer in the application of scientific research to practical problems. From a very early period in its history the relation between theory and practice was not lost sight of, and the modern method of technical instruction through lectures, discussions, laboratory practice, and a considerable amount of field work was perfected here. Its early reputation is connected with the mineralogist and geologist, Abraham Gottlob Werner, who taught there from 1775. As reorganized in 1871, the institution was placed under the Minister of Finance. Students from nine-year secondary schools are admitted. The course of study for a diploma extends over four years. Students from Freiberg may obtain the doctorate in engineering at the Dresden Technical High School on the presentation and defense of a thesis. In 1910 the student enrollment was 480. The town is the center of important smelting and mining industries in the Erzgebirge. The gymnasium at Freiberg was established in 1515.

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FREIBURG IN BREISGAU, BADEN, THE GRAND DUCAL ALBERT-LUDWIG UNIVERSITY OF. — Established by Archduke Albert of Austria in 1456, and one of the oldest universities in Germany. It attained great prominence in the days of humanism, being the center of learning for the Upper Rhine region. In 1620 the Jesuits assumed charge of the instruction in theology and philosophy, and, owing to the Thirty Years' War, a period of decline was ushered in, which continued for almost a century and a half. The Austrian government then took steps to place the institution on a more solid foundation by strengthening its teaching staff, and these efforts were nobly seconded by the Elector (later Grand Duke) Charles Frederick of Baden, into whose hands the Breisgau, formerly a hereditary possession of the House of Austria, had passed by the Peace of Pressburg (1806). The maintenance of two universities, Heidelberg and Freiburg, by a country as small as Baden furnished a problem of no mean magnitude; and on more than one occasion there was grave danger of the absorption of the younger of the two universities by the older and more renowned; but Freiburg has prospered and expanded, especially of late. The number of its summer students has grown from 225 in 1870 to about 3000 in 1910, while it ranks eighth in size to-day in the number of winter students, its beautiful location on the edge of the Black Forest being to a certain extent responsible for its popularity. The total attendance at the winter semester of 1909–1910 was 2305 (133 women), including 138 auditors (47 women), the matriculated students being distributed as follows: theology, 218; law, 415; medicine, 713; and philosophy 816; the medical school being exceeded in size only by those of Munich, Berlin, and Leipzig. In contradistinction to Heidelberg, Freiburg's theological faculty is Catholic, the Catholic theologians having been transferred from Heidelberg to Freiburg in 1817. The library contains about 300,000 volumes and 700 Mss., and the annual expenditures for the university amount to about $250,000. Among renowned teachers may be mentioned Zasius in jurisprudence, the famous preacher, Geiler von Kaisersberg, and Luther's opponent, Eck; among later ones Jacobi, the poet, and the historian Heinrich von Treitschke. R. T.

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FREIBURG, SWITZERLAND, UNIVERSITY OF. — An institution of recent origin, having been established in 1889. It consists of four faculties, viz. theology, law, philosophy, and pure science. The cantonal and university library contains 200,000 volumes and over 500 Mss. Closely associated with the university are the Historical Museum, the National History Museum, and the State Archives of Freiburg (almost 17,000 parchment documents). Lectures are given in the German, French, and Latin languages. During the winter semester of 1909–1910 there were 724 students in attendance, including 120 auditors. They were distributed by faculties as follows: theology, 235; law, 124; philosophy and pure science, 245. It is the smallest of the Swiss universities, with the exception of Neuchâtel. R. T.

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FRELINGHUYSEN, THEODORE (1787–1861). — Statesman and educator; born at Millstone, N.J., March 28, 1787. He was educated at the grammar school connected with Queen's College (now Rutgers), and was graduated at Princeton in the class of 1804. He took up the profession of law, but devoted considerable time to educational movements, and was active in the American Lyceum Association (*q.v.*). He was president of New York University from 1839 to 1850, and of Rutgers College from 1850 to 1861. He was the author of numerous pamphlets on the value of public education. He died at New Brunswick, N.J., April 12, 1861. W. S. M.

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FRENCH INFLUENCE IN AMERICAN EDUCATION. — Through the greater part of the seventeenth and eighteenth centuries educational progress in the colonies had gone hand in hand with that in England, and all non-English influences — except that of the continental Reformers, especially Calvin — had been very slight. Such elements in the colonial population as the Dutch of New York and the Germans of Pennsylvania had no inconsiderable influence on the education of those states. And the character and intelligence of the French Huguenots formed even a greater power throughout New England, New York, Virginia, and the Carolinas. It has been said (Baird, *History of Religion in America*, p. 158) that " next to the English Puritans and the Scottish Presbyterians we must rank the exiled Huguenots . . . as having done most to form the religious character of the United States " ; and education went hand in hand with religion. So, too, the influence of individual Huguenots and descendants of Huguenots, men like Benezet, the Huguenot Quaker who founded a school for negroes in Philadelphia, like Bowdoin, Faneuil, Laurens, and a little later Audubon, is not to be ignored.

But a new element entered into the whole situation when there came not only the break with England, but the alliance with France. With the treaty of 1778 begins a period in which we might reasonably look for a definite and specific French influence. Spiritual influence is of necessity subtle, intangible, difficult to determine. But a definite application of French ideas may be noted as demonstrable or probable in (1) the founding of the American Academy of Arts and Sciences in Boston in 1780, and the Academy of Sciences and Fine Arts in Richmond ; (2) the founding of the state universities of Georgia (1784–1785), New York (1784–1787), and Michigan (1817–1824); (3) the educational influence and labors of Thomas Jefferson in Virginia.

1. Benjamin Franklin (*q.v.*) had founded in 1743, and on a firmer basis in 1769, the American Philosophical Society held in Philadelphia for the Promotion of Knowledge. John Adams, as he himself tells (*Works*, ed. C. F. Adams, Vol. IV, p. 257 *sq.*), heard the Philadelphia Society praised on every hand by the scholars whom he met in Paris in 1780, and the idea was there suggested to him that a similar society should be formed in Boston. The project took root. But Boston being full just then of hostility to things English and of friendliness to things French, the founders of the new institution called it an Academy, not a Society, stating it as their intention " to give it the air of France rather than that of England, and to follow the Royal Academy rather than the Royal Society." This feeling disappeared in time, naturally; but its traces survived in the name and in the custom of issuing the transactions of the Society as *Memoirs*.

The Academy of Sciences and Fine Arts in Richmond was founded by the Chevalier Quesnay de Beaurepaire, a French volunteer in the American army and a grandson of the physiocrat. He stated his aim to be that " of connecting the United States with my fatherland by new motives of gratitude, of conformity in taste, and of more close communications between the individuals of the two countries." Its specific purpose was to foster the arts and sciences after the general model of the French Academy and to establish advanced instruction in foreign languages, mathematics, design, architecture, painting, sculpture, and the sciences (not Latin or Greek), the professors to be selected by a committee of correspondence in Paris. The whole project was endorsed by Jefferson and by many others on both sides of the Atlantic, — Condorcet, Malesherbes, La Fayette, and Lavoisier among others, — and a considerable sum of money was subscribed in France as well as in America. The erection of a building was begun in 1786, and carried to completion. But the project depended so largely on France that it was killed by the Revolution, and the building was used for other purposes. In the words of a French writer, " a theatre replaced the Academy, and the German spirit supplanted the French in American Education."

2. The first organization of the University of the State of New York as a state system of education was made in 1784, with Columbia College as its dominating element. Three years later the charter was modified, lessening the power of Columbia and emphasizing more strongly the ideas of state representation and state supervision. The University of Georgia was founded by state enactment February, 1784, amended in January, 1785, the fourteenth section of the bill declaring that " all public schools instituted or to be supported by funds or public money in this state shall be considered as parts or members of the University and shall be under the foregoing directions and regulations." (See UNIVERSITIES, STATE.)

Many details of these measures were peculiar to the states concerned and dictated by local conditions and needs. But the idea as a whole was quite new in America and unknown in England ; whereas it was familiar in France, at any rate as an ideal, and it is not unlikely that it came to America directly from the literary and political circles of Paris. There had been a marked tendency toward the centralization of education in France ever since the sixteenth century (Gobron, *Législation et Jurisprudence de l'Enseignement*, Paris, 1896, p. 18 *sqq.*), but like the equally marked centralizing tendency in government, it had been hindered by innumerable local and ecclesiastical privileges, and had never been completed. The eighteenth century brought an increase of abuses, and confusion that aroused widespread protest, and the first important step towards reform — the expulsion of the Jesuits in 1762 — threw the already tangled and ineffective educational system of the country into a confusion ten times worse. The philosophers on the one hand, and the enemies of the Jesuits in the Parliaments on the other, were alike stimulated by the needs of the situation to a series of efforts toward the reducing of the chaos to order. One of the first and best treatises called forth by the problem was that of La Chalotais, Procureur-général of the Parliament of Rennes, with the significant title, *Essai d'Éducation nationale*, but though La Chalotais maintained that the State should be responsible for and should control education, he did not attempt to outline an actual administrative scheme. This was done, however, along similar lines, by Guyton de Morveau at Dijon, and notably by Rolland d'Erceville, president of the Parliament of Paris, in his *Compte Rendu* of 1768, published in 1783 under the title *Compte Rendu, ou Plan d'Éducation et de Correspondence des Universités et des Collèges.* In the meantime Diderot, in 1776, had drawn up his famous *Plan d'une Université* for Catherine II. This remained in manuscript, it is true, until Guizot published extracts from it in 1813–1814; but it was certainly known to Naigeon in 1784–1795, and to Henri Meister, the secretary of Grimm, in 1786. At any rate, the result of the whole movement in France was seen in the successive projects of Mirabeau, Talleyrand, Condorcet (*qq.v.*) and their successors, and finally in Napoleon's university in 1808. The organization of the University of Georgia and that of New York in 1785 and 1784–1787 respectively fit in exactly with the evolution of education in France. As an actualized fact, these two universities antedate the University of France by more than twenty years, but they are the product of the same intellectual evolution.

3. The evolution in France of a state system of education crowned by a national university was a living thing to Thomas Jefferson, as to no other American of his time. If he gave but half-hearted support to Washington's plan of a national university at the capital, it was because he believed characteristically that such a project was the affair of each state; though in 1794, moved by the greatness of the opportunity, he did urge the transfer of the University of Geneva to the United States *en bloc.* In Virginia he identified himself with three educational movements: (1) a graded system of state education topped and controlled by the College of William and Mary; (2) a reform of William and Mary along French lines by the introduction of modern studies; (3) the establishment of a state university. The plan of state education was proposed in 1779 and partly carried out in 1796, fatally spoiled as far as the original intention was concerned by leaving its execution optional to local authorities and by the omission of the crown of the system — the university. The whole scheme is strikingly similar in essential principles to those mapped out by Rolland in 1768–1783, by Talleyrand in 1791, and by Condorcet in 1792. It is, indeed, decidedly more analogous to the French plans than was the University of the State of New York. Talleyrand's system, for instance, — *l'école cantonal, l'école d'arrondissement, les écoles spéciales* (professional), and *l'institut national,* — is practically an exact version in French of Jefferson's scheme of 1779 or the revised scheme suggested in his letter of September, 1814, to Peter Carr. The analogy is so close, the plan so foreign to anything hitherto planned in America or England, and Jefferson's French proclivities so clear, that a definitely French influence may be inferred with practical certainty.

The reform of William and Mary Jefferson regarded as an essential element in his proposed state system. As a visitor of the college in 1779 he was responsible for several changes, involving the abolition of the professorships of divinity and oriental languages, and the substitution of professorships in law and police, anatomy, medicine, chemistry, and modern languages; the laws of nature and nations, fine arts, and natural history were also added to the subjects already taught. "These propositions," comments Professor Adams, "represent the first current of modern ideas, which began in 1779, at Williamsburg, to flow into American academic life." Their source may be seen in a glance at any one of the many proposals for university reform made in France, from Rolland to Napoleon. (See COLLEGES, AMERICAN, HISTORY OF.)

The establishment of the University of Virginia was Jefferson's last and perhaps greatest educational achievement. Reluctantly convinced that William and Mary would never adopt the large and living educational point of view which he regarded as essential in an ideal state university, he seized on the movement for the founding of an academy at Charlottesville in 1814 as an opportunity to work for the establishment of a new institution for higher learning. The academy became Central College — a name borrowed from the familiar *École Centrale* of France — and Central College, through the unceasing efforts of Jefferson and his devoted fellow worker, Joseph Cabell, became the University of Virginia by legislative enactment in January, 1818. In the new university were embodied the ripest fruits of Jefferson's observation and experience in Europe. In its aim of making worthy citizens, its reliance on state support, its freedom from church influence, its subordination of the classics to the modern languages, political science, and the natural sciences, it reflected the whole current of French educational theory and practice. Its division into schools rather than into the ancient four faculties (arts, theology, law, medicine) had been clearly outlined in Diderot's *Plan d'un Université* (1776) and in Dupont de Nemours' work *Sur l'Education nationale dans les États-Unis* (1800). "The idea of distinct schools of art and science which is so prominent a characteristic of the University of Virginia to-day," says Professor Herbert Adams, "is the enduring product of Jefferson's observation of the schools of Paris, and of his association and correspondence with their representative men."

A further channel of French influence on American education was the introduction of the French language and literature into college and academy curricula. The finishing schools, especially those for girls, of the latter half of the eighteenth century frequently advertised the teaching of French. Here, however, it was classed with music, dancing, and embroidery, as a "polite accomplishment." During this period and the early nineteenth century, French was introduced into some of the more advanced of the academies on a somewhat higher plan. Its introduction into the college curriculum during the same period had, however, more profound educational significance.

Instruction in French had been allowed at Harvard as early as 1735. But the instructor, "who had been employed under the authority of the president and tutors as an instructor in French," was accused of "disseminating certain dangerous errors in college," and the experiment was short-lived. In 1769 it was voted that a certain Mr. Curtis, "professing himself to be of the protestant religion," be allowed to teach French to such scholars "whose parents by writing under their own hands shall signify their desire for that purpose to the tutors, except in the hours appointed for academical studies and exercises." With the Revolution opposition to things French became less pronounced, and was replaced in many academic centers by enthusiasm. The College of William and Mary established a chair of modern languages in 1774 ; and Columbia the first chair in French in 1784. The first chair in French at Harvard was founded in 1815, by which time several other colleges had made similar establishments.

The introduction of the study of French was associated with the period in American college history, from 1770 to the second decade in the nineteenth century, which was marked by the growing freedom and license of the student body, by decline of faculty control, by the overthrow of the strict ecclesiastical dominance, and by the introduction of the study of the sciences. The early part of this period, the years of and immediately following the Revolution, was characterized by license in conduct, and extreme freedom of thought and infidelity among the students. To a certain extent this was associated in the popular mind with the French influence. Consequently came this opposition, cited above, to the study of French. It is impossible to say now to what extent such influence did or could come from the study of the language of the French literature, but it certainly formed an influence by which ideas more tolerant to broader views of life were brought in at that time. It was an important means for making known the French ideas of that most important epoch.

Since the early part of the nineteenth century the influence of French educational ideas and practices on America has been very slight; and such as has been exerted came indirectly through Swiss or German channels, and was of a vague and indefinite cultural character, which has little connection with organized education. See, however, FRANÇAIS, ALLIANCE.

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FRENCH INFLUENCE IN ENGLISH EDUCATION. — The ecclesiastical and political connection between France and England during the Middle Ages constantly enriched the scholarship and education of both countries by the influence of men of learning and administrative ability. This reciprocal influence is illustrated by the work of Alcuin of York (*c.* 735–804) and Alfred (849–901). The former, from 782 to 790, was master of the Palace School, established by Charles the Great, of whose educational policy he was the chief instrument. "In the morning of his life," he wrote, "he sowed in Britain; and now, in the evening of that life, he ceased not to sow in France." The educational plans of Charles the Great served in turn as a model for those of the English king, Alfred, the first great organizer of education in England.

From French centers of learning there were drawn many of the organizers of English education. Thus Oswald, Archbishop of York (d. 992), having himself been educated at Fleury on the Loire, invited the Abbot of Fleury to become instructor to the monks at the abbey founded by the archbishop at Ramsey. The Norman Conquest strengthened the connection between France and England, and from the Norman Abbey of Bec, famous for its educational activities, came Lanfranc, consecrated as Archbishop of Canterbury in 1070, and

Anselm, consecrated as his successor in 1093. Both of these archbishops maintained the cause of learning in England, and by their policy strengthened the control of the Church in English education.

The great school of Chartres (*q.v.*) attracted many students from Britain, *e.g.* John of Salisbury (d. 1180) and Adelard of Bath (*qq.v.*). But the University of Paris, described by Alexander Neckam as *paradisus deliciarum,* was the great lodestone of British students and the dominant influence in the creation of the English universities. It is probable that the older Oxford schools rose to the position of a *studium generale* through a migration of students from the University of Paris about 1167, and the great dispersion of the masters and scholars from Paris in 1229 may have been the chief factor in the early development of the University of Cambridge. One of the four nations into which the Faculty of Arts was divided at the University of Paris bore the name of the English; and, though the latter shared their membership with Germans and other students from Northern Europe, the fact that they gave their name to it shows their numerical importance in this division of university life. Edmund Rich of Abingdon, Roger Bacon, and William of Ockham were students at Paris as well as at Oxford. The intellectual and personal ties between the two universities were very close, especially in the thirteenth century. Oxford recalled Paris in constitution and in customs. It may be said that France gave England much of the form of its ancient university institutions, and inspired Englishmen with the love of scholastic philosophy in which they excelled.

In the English grammar schools French influence was strong down to the middle of the fourteenth century. From the Norman Conquest the pupils were compelled to " leave their own language and to construe their lessons in French." John de Trevisa noted, however, in 1385 that this custom, which had been prevalent down to the first appearance of the Black Death in 1349, had already changed, so that " in all the Grammar Schools in England, children leave French and construe and learn in English." (See ANGLO-NORMAN DIALECT.) This great change may have been due to the mortality of the French priests at the time of the Black Death (*q.v.*) or to their departure to escape its infection. The break in educational tradition thus caused by the plague opened the way for the general use of the mother tongue in the English grammar schools. In methods of teaching Latin, however, the old influences held their own. One of the two Latin grammars most used in medieval English schools was written by Alexander of Ville Dieu (*q.v.*) in Normandy, who kept a school in Paris and wrote in 1209 his *Doctrinale Puerorum,* a grammar in Latin verse. Throughout the Middle Ages, indeed, the English education was in great measure assimilated to continental models, in forming which French culture bore a leading part.

Passing over the period of the Renaissance, during which French influence in English education was intermixed with Italian, we come to the age of Louis XIV, when French standards again determined the course of instruction and training for boys in many families belonging to the wealthier classes of English society. This wave of French influence culminated in Locke's *Thoughts concerning Education,* published in 1693. In Locke there are marked traces of the influence of Montaigne, of Descartes, and of the Gentlemen of Port Royal. The schoolbooks prepared by the Port-Royalists were used in England, and became a model for the writers of Latin and Greek grammars for use in English schools. The strength of French influence upon English ideals of education during the first half of the eighteenth century is shown in Lord Chesterfield's *Letters to his Son.* " A Frenchman," he writes, " who with a fund of virtue, learning, and good sense has the manners and good-breeding of his country, is the perfection of human nature. This perfection you may arrive at, if you please, and I hope you will do so." To behave in all companies as a cultivated French gentleman would behave was the standard of manners to which he most desired that his son should attain. Through the writings of Rollin, the inheritor of the traditions of Port Royal, the educational influence of France percolated very widely through English teaching in the middle of the eighteenth century. The wider curriculum of study which French writers made popular attracted Joseph Priestley (*q.v.*), who, in an *Essay on a Course of Liberal Education for Civil and Active Life,* published in 1765, advocated a new ideal of liberal culture in the education of the English middle classes, then rapidly rising in social influence and political power.

The writings of Fénelon and of Madame de Lambert (1647–1733) greatly influenced English ideas about the education of girls. No English book did more to raise the moral standards of girls' education than the *Serious Call,* published in 1728 by William Law, himself a careful student of Fénelon.

The writers in the French *Encyclopédie* influenced the thought of Adam Smith, whose references to public education in the *Wealth of Nations* (Book V, Chapter I, Article II), published in 1776, greatly affected English policy in regard to educational questions. An essay on endowments (*q.v.*), written by Turgot in 1756, seems to have made a deep impression upon the mind of Adam Smith. In this paper Turgot endeavored to demonstrate the obstructive effects of educational and other endowments in national life. In the *Wealth of Nations* Adam Smith argued that the endowments of schools and colleges had diminished the necessity of application in the teachers, and had prolonged acceptance of exploded and antiquated opinions. His practical inference was that in secondary and higher education voluntary effort and the free play of supply and demand would always accomplish more than endowed institutions, the existence of which hampered the growth of independent initiative. At the same time he was forced to admit that the State should impose upon " the whole body of the people the necessity of acquiring the most essential parts of education." But in thus acknowledging the necessity of some measure of governmental intervention, Adam Smith's scheme fell far short of the later educational plan of Turgot, contained in the latter's memorial to the King *Sur les Municipalités*, written in 1775. In fact, Adam Smith reflects the first phase of French revolutionary influence in English educational thought. He shared with the French Radicals a distrust of ecclesiastical control in public education and a desire to sweep away the power of ancient educational endowments, on the ground that these were mainly connected with clerical effort. He also perceived that, in place of the Church, the State must enforce at least a minimum of educational discipline throughout the nation. But here he stopped, while his French contemporaries were swiftly carried forward to the point at which they advocated a stringent form of state control over all grades of schools and colleges. From about 1760 to 1810, French speculation had a double influence upon English educational opinion. One side of its influence was liberative and antagonistic to old conventions. It encouraged a return to nature in educational method. It deepened the dislike of old endowments and drew attention to their torpor, inelasticity, and failure in public duty. This side of the influence of French revolutionary thought, strongest through Rousseau, showed itself in Mary Wollstonecraft's *Vindication of the Rights of Women* (see GODWIN, MARY WOLLSTONECRAFT), with its argument for coeducation both in elementary and secondary schools; in the writings of Richard Lovell Edgeworth (*q.v.*), and his daughter, Maria Edgeworth (*q.v.*), and in the educational experiments of Thomas Day (*q.v.*). The other and conflicting tendency of French revolutionary thought in education was toward some more stringent form of public control over all grades of schools. This influence showed itself in a rudimentary form in Adam Smith's *Wealth of Nations*, but more conspicuously and with logical completeness in Robert Owen's *New View of Society* (1816). These two currents of thought had a double effect upon the more conservative side of English education. They produced a movement for self-reform within the older endowed institutions; and at the same time they made public opinion reluctant to sanction any great extension of educational opportunities, for fear lest the sudden increase of book knowledge should precipitate violent political change. The reforms at Oxford in the earliest years of the nineteenth century, the increased activity of many of the old endowed secondary schools, and the energetic efforts of the Church of England and other religious bodies to grapple with the educational destitution of the masses of the people, a work which had the hearty support of Wordsworth and Coleridge, were illustrations of the first result. The rejection of Mr. Whitbread's Bill for Elementary Education in 1807, which, if carried at the time, would have anticipated some of the great reforms of 1870, showed how potent were the fears to which French revolutionary thought and action had given rise among the more conservative classes of English society.

French influence in English education during the century 1810–1910 falls under three main heads, (1) philosophical, (2) political, (3) administrative.

1. In the domain of direct philosophical influences, the names of three French thinkers are of preëminent significance in their relation to English educational thought, — Helvétius, Saint-Simon, and Auguste Comte. Helvétius (*q.v.*) had a strong posthumous influence upon Robert Owen, Jeremy Bentham, and George Combe (*qq.v.*). The realism of his political thought, the emphasis which he placed upon personal interest as the primary motive of action, his belief in the omnipotency of education, and his conviction that there must be a close bond between the life of the individual and that of the community, showed themselves in English thought (*a*) in a growing disposition to recognize the claim of every individual to equal educational opportunity, (*b*) in that individualistic utilitarianism which took rather a matter-of-fact and prosaic view of the course of instruction, (*c*) in impatience with whatever obstructed the spread of this new educational ideal, and (*d*) in an undercurrent of collectivist thought in matters of school organization. To the influence of Helvétius that of Saint-Simon (1760–1825) and his followers was a corrective. It showed itself especially in the change of tone in the writings of John Stuart Mill (*q.v.*) from 1830 onwards; in the gradual weakening of the spirit of anti-governmental *laissez-faire* which had affected much of English liberalism; in a freshly kindled passion of interest in the poor and pity for their condition; and, not least, in a strong conviction that women should enjoy social and educational opportunities equal to those of men. The influence of Comte (*q.v.*) and of Positivism showed itself mainly in a growing belief in science as the chief factor in education. It also weakened the more fanatical kind of anti-clericalism by emphasizing the need for a spiritual authority in national education.

2. The political influence of French thought upon English educational affairs centers chiefly

round three dates: 1833, when Guizot organized French elementary education; 1850, when the *Loi Falloux* recognized two types of elementary school, viz. public schools maintained by the communes and private ones maintained by individuals or by religious associations; and 1881, when Jules Ferry (*q.v.*) abolished school fees. Each of these three measures had a direct influence upon English education. Guizot's act of 1833 helped in convincing English statesmen that the government must take a more active part in superintending the work of elementary schools, and thus helped in securing the first vote for training colleges (the name of which, "normal school," was taken from France) in 1835, and the establishment of the Committee of Council on Education, the germ of the Education Department, in 1839. The *Loi Falloux* of 1850 probably suggested (not to W. E. Forster, but to those whose ideas influenced his administrative proposals) the plan of the dual system of board schools and voluntary schools, each recognized and aided by the State, which was the central feature of the Elementary Education Act, 1870. The abolition of fees in French elementary schools by Jules Ferry in 1881 was taken as a precedent (though not the only precedent) for the Elementary Education Act, 1891, which virtually introduced free education into England.

3. The administrative influences of French education have not been less important than the political. Among the chief of them may be named the recourse to open competition as a method of filling posts at the disposal of the Government; the idea of higher elementary schools; and the inclination to remove religious instruction from the curriculum of state-aided schools and to substitute for it some form of moral instruction upon a philosophical basis.

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FRENCH INSTITUTE. — See Institute of France.

FRENCH, JOHN H. (1824–1888). — Institute conductor and textbook author; educated in the common schools. He was teacher and principal of schools in New York and Connecticut, superintendent of the schools at Syracuse, and State Superintendent of Schools of Vermont, instructor in the Albany Normal School, and principal of the State Normal School at Indiana, Pa. During his last years he was institute conductor in New York. He was the author of several mathematical and geographical textbooks, and a work on form study and drawing.

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FRENCH LANGUAGE AND LITERATURE IN THE SCHOOLS. — See Modern Languages and Literatures in the Schools.

FRENCH REVOLUTION AND EDUCATION. — See France, Education in; Rousseau.

FRESH AIR SCHOOLS. — See Outdoor Schools.

FRIARS. — See Dominicans; Franciscans; Monastic Education.

FRICK, OTTO (1832–1891). — A German schoolman; born in Schmitzdorf, near Magdeburg. He received his early education from his father, a Lutheran pastor. At the age of thirteen he entered the Joachimsthal Gymnasium in Berlin, where he came under the influence of Wiese (*q.v.*). In 1851 he became a student in the University of Berlin, but in the following year he went to Halle, where he spent three years in the study of philology and history, devoting some attention also to philosophy and theology. From 1855 to 1857 he was in Constantinople as the tutor of the sons of the Prussian ambassador. After serving for seven years as a teacher in various Prussian gymnasia, he was promoted to a principalship at the early age of thirty-two years, and in 1880 received the appointment as Director of the *Franckesche Stiftungen* in Halle. He renewed the *Seminarium Praeceptorum*, which had been founded by Francke, but had ceased to exist since about 1795. This institution became a model for the training courses for teachers of the classical schools that were established in connection with a number of gymnasiums in Prussia and other German states. In 1884 he founded the pedagogical magazine, *Lehrproben und Lehrgänge*, in which questions of methodology were treated and model lessons for the higher schools were published. His methods were based on Herbart's pedagogy and tested by his own classroom experience. He insisted on the necessity of a pedagogical preparation for the teachers of the higher schools, and the fact that this necessity is at present generally recognized in Germany is, to a large extent, due to the efforts of Frick.

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FRIENDS, EDUCATIONAL INFLUENCE OF SOCIETY OF. — **England.** — The influence of the Society of Friends on elementary education in England has been so profound that it is important to consider it in some detail. George Fox (July, 1624–Jan. 13, 1691), the founder of the Society of Friends, was the son of Christopher Fox, a weaver ("righteous Christer "), and was born at Drayton-in-the-Clay, in Leicestershire. He had little education, according to Dr. Hodgkin, " both the spelling and writing of his letters being those of an illiterate person." Before he was twenty, he received a religious " call," and wandered through the country in a species of mystic agony. He began preaching in 1647 at Dukinfield in Cheshire and at Manchester, and in 1648 he first tells us of " a Meeting of Friends " at Little Eaton, near Derby. The influence of Baptist ideas was clearly noticeable. Fox soon had thousands of adherents, whom he calmed and organized. The term "Quaker" at once arose in consequence of a retort made to Fox by one of a bench of magistrates before whom he was summoned. In answer to Fox's exhortation to " tremble at the word of the Lord " the magistrate replied " Quaker." The name occurs in the House of Commons Journals for 1654. At this date Fox was already being helped by Mrs. Margaret Fell of Swarthmoor Hall, whom he subsequently married. Sixty preachers submitted their reports to her in 1654. In the period when all Dissenters were subject to persecution, from 1662 onwards, under the Acts of Uniformity of 1662 and the " Five Mile " act of 1665, the Friends not only kept their meeting houses open, but deliberately opened schools in the teeth of the law. Thus when at Reading in 1664 and at Bristol in 1682 nearly all the adult members were thrown into jail, the meetings were practically kept by the children. In 1667 George Fox advocated the foundation of schools for boys and girls, and by 1671 there were at work more than fifteen Quaker schools. In 1689 there occurs in " The Quakers Remonstrance " (*Harleian Miscellany*, Vol. VII, p. 612) the following significant paragraph: —

" 11. That our youth be not suffered to travel abroad, but between twelve and sixteen, and that under the conduct of approved Protestants; for this present way of education is chiefly in pleasure and looseness, which makes way for atheism or popery, no religion or false religion."

The idea of foreign missions was gradually developed, and in 1737 the teaching of foreign languages was commended by the Friends to facilitate the spread of Christian truth. " In 1696 John Bellers' large and interesting plan for industrial education was broached, and in the following year Friends were officially encouraged to provide free education 'for a competent number of the children of poor Friends,' and to arrange for the training of teachers." In 1702 a school for poor boys was founded at Clerkenwell by the London and Middlesex Quarterly Meeting. It was removed to Islington in 1788, to Croydon in 1825, and to Saffron Walden, where it now is, in 1879. It has changed its character, and is to-day a school for middle-class children of both sexes of the Society of Friends. It is endowed, and admits paying scholars who are not children of Friends. The Friends kept their educational work alive in remarkable fashion during the eighteenth century. In 1798 their deep educational influence suddenly became a national fact, for in that year Joseph Lancaster (1778–1838), already a member of the Society of Friends, set up his famous school in the Borough Road. In the same year an adult school (*q.v.*) was opened at Nottingham, which passed into the care of a Friend, Samuel Fox, and still exists. This was probably the small beginning of the great Quaker adult school movement. Quaker help made Lancaster's work possible on a large scale. Two Friends, William Allen and Joseph Foster, joined the Committee in 1808. In fact, " the movement owed its inception and most of its early support to members of the Society of Friends . . . there was something akin to the very genius of the Society in his whole enterprise. It was at once liberal and religious, practical and philanthropic. It chimed in with their message, and harmonized with their practice." Many are the great Quaker names that lent their support to the movement. In Ireland Lancaster received Quaker support. The Friends had been at work there before Lancaster's time, and had, in 1786, founded a School Society in Dublin, whose schools seemed to have welcomed children of all denominations. Another Friend was one of the great pioneers of modern elementary education in England, W. E. Forster (*q.v.*), who introduced the Education Act of 1870, and whose relatives had done so much for the Lancasterian movement. It may therefore be claimed that a powerful Quaker influence lies behind the great English educational movements of the nineteenth century; and from the point of view of the history of education, it is necessary to remember that this influence is closely related to the revival of elementary education (largely due to the efforts of Dissenters) in the last quarter of the seventeenth century; a revival that the Quakers carried right through the dark days of the eighteenth century. One eighteenth-century school has already been mentioned. To this must be added the Ackworth School, near Pontefract, in Yorkshire, founded by the London Yearly Meeting in 1779 for the children of Friends " not in affluent circumstances." It is a flourishing school to-day, teaching many boys and girls. But the Friends attached themselves to all educational movements. In 1793 were founded the Sunday and day schools at Rossendale in

Lancashire. In 1800 there existed a Friends' school at Lothersdale near Skipton "for the preservation of the youth of both sexes, and for their instruction in useful learning," and at the same date there was another at Nottingham. At Bristol a Sunday school for boys was founded in 1810, and another for girls in 1811. The Friends' Sunday schools were in reality missionary schools for the poor. "At the end of 1910 there were in connection with the Friends First Day Schools Association 248 schools with 2891 teachers and 25,038 scholars, very few of whom were the children of Friends. Not included in these figures are classes for children of Members and Attenders." These classes are usually held before or during a portion of the time of the morning meeting for worship, and distinctly denominational teaching is given. Some reference has been made above to the Adult School at Nottingham of 1798. This seems to have been the precursor of the adult schools started by the Society at Birmingham in 1845, in which reading and writing were the chief inducements offered. "At the end of 1910 there were in connection with the National Council of Adult School Union, 1200 schools for men with a membership of about 69,089, and 683 for women with a membership of about 39,000." It is finally necessary to refer to the Friends Foreign Mission Association, which controls thirty-five schools with 7042 pupils in Syria, India, and the Far East. The educational activities at the present hour of the Society of Friends in England (a small body comprising more than 19,000 persons in full membership) are remarkable indeed, and the historical significance of their work is of the very highest importance. To-day they support secondary and higher educational schools in the following places (the date of the foundation is in parentheses): Saffron Walden (1702); Ackworth (1779); Sidcot, Somerset (1808); Wigton, Cumberland (1815); Bootham School, York. (1823); Mount School, York (1831); Rawdon, near Leeds (1832); Penketh, near Warrington (1834); Great Ayton, Yorks. (1841); Sibford, near Banbury (1842); Dalton University Hall, Manchester (1876); Leighton Park, Reading (1890); the Woodbroke Settlement for religious and social study (1903); Kingsmead (Training School for Foreign Missions), Birmingham (1906); and the Birmingham Training Institute for Sunday School Workers (1907). The Flounders Trust for training teachers (1848), Gibson's bequest for educational purposes, teachers' scholarships for women, the association for promoting the training of women teachers (1870), and the Guild of Teachers (1896) are additional educational agencies. J. E. G. de M.

In America. — When the Friends invaded the American colonies, they brought with them a belief in a thorough, careful, elementary education for all their children, and the mastery, even by the wealthy, of some trade. But as they made no distinction between clergy and laymen, the incentive which led to the foundation of Harvard, Yale, and Princeton in colonial times did not exist. The divine call was so emphasized that intellectual preparation for the ministry assumed a position of inferior importance. Some of the more narrow even pressed the advantages of ignorance, as making the minister more responsive to heavenly influences. While this attitude was not general, the absence of institutions of higher learning tended to raise a few generations, of most exemplary lives, it is true, and devoted to moral reforms, but with the conceptions of life usually attending a mediocre education. The loss of high intellectual training they felt less keenly, as they adapted themselves to its omission; and it was not till 1856 that the first Quaker college was established. In the meantime the primary and secondary education of Friends and others surrounding them was amply provided for, and in this field rests their claims to general influence and leadership. The colonial schools were day schools, and hence were patronized only by the boys and girls of the locality. They were usually in close proximity to the meeting houses, and attendance at "mid-week meeting" was compulsory on all, Friends and others. These meetings were very simple, but often impressive occasions, and at the least, a valuable discipline in self-control. Wherever a community of Friends existed, whether in city or country, the schoolhouse was an immediate necessity; and as in those days but few other schools existed, it often constituted the educational opportunity of the neighborhood.

The most noted of these colonial schools was the Friends' Public School of Philadelphia. Founded in 1689, with George Keith as headmaster, chartered by William Penn in 1701, 1708, and 1711, each time with a more liberal charter, it was, till the public school system of Pennsylvania was established, the center of the best educational impulses of the city. The central school was a classical school for boys. There were branches in various sections. Some were confined to Friends. Some were for boys and some for girls. Some were free, and others demanded varying payments to accommodate parental resources. Upon the establishment of the state public schools, and the withdrawal of Friends' children to "Select," that is, strictly denominational schools, the patronage was much reduced; and in 1875 the various resources at the disposal of the trustees were combined in one college preparatory school of high grade, of which up to the date of writing (1911) Richard M. Jones has been the only headmaster. This school, now called the William Penn Charter School, is the largest of its class in Philadelphia, and its old boys hold many positions of honor and usefulness in the city and in various colleges and universities.

The Yearly Meetings, which constitute the largest grouping in the ecclesiastical system of Friends, which were the ultimate authorities and covered the territory from Rhode Island to North Carolina, again and again recommended the establishment of schools. In obedience to such behests, the local meetings would sometimes use the meeting house, or more often would build a separate schoolhouse, and the school would begin in a small way. Such schools were taught by Friends, and patronized by Friends and others. A committee of the meeting would visit them periodically, and closely supervise their operations. They created a desire for education, and practically destroyed all absolute illiteracy. By this general education they prepared the way in many places for the more complete state system which followed.

There were many, probably an unusual number, of self-educated Friends in the eighteenth century. This education was often in special subjects. Botany and the natural sciences had learned devotees, and we read of farmers and tradesmen not a few, who enjoyed classical reading or the solving of mathematical problems. In colonial Philadelphia, as we infer from the *Journal of John Smith* and other sources, there was a group which enjoyed rather wide reading and a scholarly aspect toward life's problems, as well as an earnest and practical appreciation of the responsibility of citizens.

After the Revolution the age of boarding schools opened. They were intended to gather in the better boys and girls from the scattered districts, where good day schools higher than elementary could not be maintained. In 1784, largely through the influence of Moses Brown, a small school was opened in Portsmouth, R.I., which had a struggling existence of four years. Its property was husbanded, and in 1814 the school was reopened in Providence, where it has been in successful existence since, now having the name of its founder. It has always been managed by a committee of New England Yearly Meeting, and has embraced both boys and girls of the college preparatory stage of advancement. Another boarding school was opened at Vassalboro, Me., in 1850. The New York Friends in 1796 founded a school at Nine Partners, N.Y. This was afterwards moved to the shores of Cayuga Lake at Union Springs, and is now the Oakwood Seminary.

In Philadelphia Yearly Meeting there was the strongest educational system. Several day schools of good grade were founded early in the nineteenth century, but the great effort centered in Westtown Boarding School in the country some twenty miles west of Philadelphia. It was a combined effort, though John Dickinson, the " penman of the Revolution," and Owen Biddle, also a Revolutionary official, had as much influence as any in its origin. It was opened in 1799, and, alone among the secondary Friends' Schools of the colonial states, it has retained its exclusive character, none but Friends being admitted. There is also a system of small primary schools scattered through the country, and a number of excellent secondary day schools in Philadelphia and suburban towns. In addition to the schools managed by committees of the Meetings, there were prior to the establishment of state schools a large number of private academies, schools where much individual work was done, unfettered by the grade system. As many of these were owned by Friends, almost the whole question of primary and secondary education of southeastern Pennsylvania and West Jersey up to 1840 was under Quaker influence.

Baltimore Yearly Meeting started a boarding school at Sandy Springs, Md., which opened in 1817. After a struggling existence of about nine years, it was sold, and the proceeds used directly for the education of Friends' children in other schools. In North Carolina the Yearly Meeting established New Garden Boarding School, now Guilford College, in 1836.

The education in these boarding schools was of a simple, thorough sort. The curriculum in early days was greatly limited, there being but little classics or modern languages. The great staples were mathematics, observational science, and English grammar. The rules were rigid, made by supposedly wise men according to their ideas of right and propriety. The children submitted when they had to, but discipline was largely a game, played on the masters' side with great skill by some, with mortifying failure by others. The dress, language, and habits of Friends were demanded of all, and religious exercises were a necessary and frequent part of the weekly program. This preserved the type in some cases, and produced rebellion and reaction in others. The best were thoroughly trained in fundamentals, and were taught habits of hard work and accurate attainment. In mathematics especially there was unusual proficiency.

Among the men who influenced education in these days were Joseph Lancaster, the eccentric Englishman, who tried to introduce his monitorial system into Philadelphia schools, his apostle John Griscom, of New York, a noted chemist and teacher, Enoch Lewis, John Gummere and Benjamin Hallowell, accomplished mathematicians, and John Forsythe, a Scotch-Irish immigrant. Lindley Murray and Goold Brown, the grammarians, were both Friends.

It was due to the efforts of Friends, and based on their institutions as models, that the public school system was started in several places. In New York City a free school for girls not belonging to any denomination was started in 1802 by Friends. This led to the establishment soon after of other schools for boys. and to the society of which De Witt Clinton was president, from which the city system resulted. A large proportion of his supporters were Friends. The Free School Society was formed in 1805, and in 1825 the name was changed to the Public School Society (*q.v.*). It was devoted to giving non-church children of the poorer classes an elementary education, which included Biblical instruction. In Philadelphia the Adelphi and Aimwell schools, the latter still existing, for boys and girls respectively, were formed about the year 1808, for similar purposes, and some of the public schools were doing the same work. These helped to form public opinion in favor of general education. In 1827 the Pennsylvania Society for the promotion of Public Schools supplied the popular support for the movement, then pending. Roberts Vaux, a Friend, was president and leading man, and Dr. George Smith in the legislature was active in perfecting the system.

While Friends were thus giving an impetus to public instruction, many of their members, when they found that it involved double-taxation for them if they maintained their own schools, were at least lukewarm in its support, and the Quaker districts already well supplied with schools were slow to take advantage of state laws.

The "Separation" of 1827, which divided the Society of Friends into two opposing bodies, resulted in a duplication in part of the system. The "Orthodox" Friends retained the majority of the old schools, while the other body established new day schools in New York, Philadelphia, and Baltimore, the George School, a boarding school in Bucks County, Pa., and a number of smaller schools covering the country districts. The migration of Friends to the westward resulted in the establishment of large meetings at first in Ohio and Indiana, then in Iowa, Kansas, Oregon, and California. Great numbers moved from North Carolina to escape slavery and its consequences. With them went at first their little schools, then their boarding schools and academies. Many of these did not prosper, for the public school system in some cases antedated them, in others followed close on their heels. In eastern Indiana, especially, the little Friends' schools connected with every meeting were potent in their influence for good, and educated a great number of men and women who as teachers extended that influence widely.

About 1850 the collegiate era began. Haverford School, near Philadelphia, founded in 1833, became Haverford College (*q.v.*) in 1856, though prior to this date its work was largely of a collegiate grade. Swarthmore College (*q.v.*) in the same neighborhood opened its doors both to boys and girls in 1864, and Bryn Mawr College (*q.v.*), for girls only, in 1885. These three institutions, though not large, are well endowed, well-built colleges of high grade, situated in beautiful parks and maintaining excellent faculties. New Garden School, North Carolina, became Guilford College in 1889. The boarding school at Richmond, Ind., became Earlham College (*q.v.*) in 1859, and there followed within a few years the establishment of Wilmington College, Ohio, Penn College, Iowa, Friends' University, Kansas, Central College, Nebraska, Pacific College, Oregon, and Whittier College, California. These constitute, with a few academies, the whole of the Quaker school system west of the Alleghanies, the primary and secondary education having been handed over to the public school system. In the East, especially in and around Philadelphia, the whole line of schools still exists in undiminished efficiency. The Western colleges are not heavily endowed. All but Earlham have preparatory departments, which in some cases have larger enrollments than the colleges. In the East the colleges are under the care of self-perpetuating boards of trustees, who are generally Friends; in the West they are organically connected with the Yearly Meetings and managed by their committees. Outside of their own colleges, Friends have had some share in the development of higher education. Moses Brown greatly aided Brown University, though the man for whom it was named, a relative, was not a Quaker. Ezra Cornell and Johns Hopkins, who founded the universities which bear their names, were Friends.

The education of Friends has always been characterized by thoroughness in the fundamental subjects. They have not yielded to the frequent diversions to new methods and objects which have been a part of our American system. This conservatism has been in some respects a disadvantage, but it has had the effect to produce honest, effective scholars so far as they have gone. This discipline has also reacted on character, so that the products of Friends' Schools have but seldom proved tricky or superficial men in business or politics.

Friends have always demanded in their schools what they have meant to be effective religious instruction. Until the last half century this has been confined to memorizing Scripture texts, and required attendance at the simple religious exercises of Friends, largely silent, and always without music or prearranged speaking. On some this discipline has produced great seriousness, on many others it has seemed to be entirely without effect. The moral results have been of a high order. Whether by the strict regulations of the earlier days, or the more liberal coöperation with student activities of recent times, a standard has been maintained which has given them some reputation, both as to the internal conditions and the resulting character.

In recent years there has been a strong drift among Friends toward graduate instruction in the great universities. The effect of this is strongly felt upon the society. The old jealousy of learning has disappeared, and the schools of all grades are feeling the impulse. With a considerable adherence to conservative methods, and a sentiment for honest statement and simple living, there is also a growing demand for real scholarship in all fields of learning, and its proper liberalizing effect upon thought and character.

I. S.

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FRIENDS' UNIVERSITY, WICHITA, KANS. — A coeducational institution, opened in 1898 under the auspices of the College Association of Friends, under a state charter received in 1891. Preparatory, collegiate, normal, commercial, musical and biblical departments are maintained. Students are admitted on a high school certificate or by an examination, the requirements for which are equivalent approximately to fifteen units. There is a faculty of twenty-one members.

FRIEZE, HENRY SIMMONS (1817–1889). — College professor and educational writer; was graduated from Brown University in 1841. He was tutor at Brown from 1841 to 1845, and principal of the preparatory school connected with the university from 1845 to 1854. During the next thirty-five years he was professor in the University of Michigan, and during three periods (1869–1871, 1880–1882, and 1887–1888) acting president of the university. Author of *Ancient and Modern Education, Life of President Henry P. Tappan,* a series of Latin texts, and numerous articles on education.

W. S. M.

See Michigan University of.

FRISIUS. — See Gemma Frisius.

FROEBEL, FRIEDRICH (1782–1852). — The founder of the kindergarten, and exponent of a philosophy of education which has exerted an ever-widening influence upon other educational institutions; was born at Oberweissbach, a village of Thuringia, in 1782.

Biography. — The early childhood of Froebel was somewhat unhappy. His mother died during his first year, and the austerity of his father, who was minister of the parish, led to an estrangement that was very keenly felt by the younger Froebel. He was rescued from the neglect and harshness of a stepmother by his uncle, another clergyman, but of a more genial type than the elder Froebel. With this uncle at Stadt-Ilm Friedrich remained for five years, reasonably happy in his lessons, more than happy in his observation of animals and plants and in the society of his schoolfellows. In 1797 he was apprenticed to a forester at Neuhaus, where he studied geometry, botany, and mathematics, and even found occasion to attend and enjoy a performance of Iffland's *Huntsmen.* The forester, indeed, taught him nothing, but to disguise his neglect made an ill report of the youth to his father. By a fortunate chance the young Froebel was enabled to visit one of his brothers during the year 1799 at Jena. There for a time he attended lectures; but having fallen into debt, returned home and comforted his father in his last days. Froebel then became an actuary at Bamberg, and subsequently an accountant in Baireuth and later in Mecklenburg. At Bamberg he became interested in the philosophy of Schelling, which directly and indirectly was to exercise a great influence over his own world view. In 1805 Froebel went to Frankfort to pursue the study of architecture, but allowed himself to be deflected from his purpose by Grüner, the director of the normal school, who persuaded him to become a teacher. He now felt as a bird in the air, a fish in the water, and on his first holiday took occasion to visit Pestalozzi in Switzerland. After two years under Grüner, he decided to resign in order to prosecute his own studies; but was persuaded to accept the tutorship of three boys, with whom he seems to have laid the foundation of certain of the kindergarten occupations. In 1808 he journeyed with his pupils to Yverdon, and there lived in close association with the Pestalozzian institution, which fortunately served to stimulate his enthusiasm for education, without engendering in any way the conviction that its problems had been solved. Froebel returned to Frankfort in 1810, and in July, 1811, he proceeded to the University of Göttingen. By this time his definite aim was to find how to educate a human being scientifically; and it is significant in his educational philosophy that his researches for this purpose were primarily made, not among children, but in the fields of chemistry, physics, mineralogy, and natural philosophy. Natural objects were to Froebel the keystone to the life of men. In October, 1812, Froebel was attracted by the lectures of Weiss and Savigny to the University of Berlin, where he became in the meantime a teacher in the school of the Pestalozzian Plamann (*q.v.*). In 1813, however, he joined in the war of liberation, although, as he remarked, "no Prussian," and ill-fitted by constitution for the rigors of the war. "It was hardly possible for me to conceive how any young man capable of bearing arms could think of becoming an educator of children whose country he would not defend with his blood or his life." As a soldier Froebel won the friendship of Langethal and Middendorf, afterwards faithful associates in his life work, through whom his philosophical interest in Fichte (*q.v.*), Schleiermacher, and Neander (*q.v.*) was aroused and thoroughly established.

Having seen nothing of the field of battle, Froebel was back in Berlin University in 1814 as assistant to Professor Weiss in the mineralogical museum. At this time he declares that he studied profoundly the works of Rousseau, Pestalozzi, Basedow, and Fichte on education; and when the death of his brother Christoph in 1816 left him the guardian of Christoph's children, it naturally occurred to him that here was the nucleus of a school to be conducted upon a psychological and scientific basis. The outcome of his new determination was the foundation of the Universal German Educational Institute at Griesheim, transferred in 1817 to Keilhau. Thither came Langethal and Middendorf. In 1808 Froebel had taken to himself a worthy wife in Mlle. Henriette Wilhelmine Hoffmeister, herself a student of Fichte and Schleiermacher, a woman to whom Froebel owed more in his subsequent institutional work than has yet been generally recognized. From this time Froebel began to be a prolific writer. The *Education of Man* appeared in 1826; and the admirable autobiographical letter to the Duke of Meiningen was written in the following year. In 1828 Froebel drew up a plan for a national educational institute at Helba, for which he vainly expected the support of the Duke of Meiningen; the plan, however, is still the basis of many of the kindergarten occupations. In 1831 Froebel was again in Frankfort, whence he accepted the call to open a school at Wartensee, which was soon afterwards transferred to Willisau. In 1833 he had got as far as offering a training course for teachers at Burgdorf, where in 1834 he founded an orphanage. From 1836 his peculiar attraction to young children became more manifest than had hitherto been the case; and the institutions founded in 1837 at Blankenburg, the first kindergarten, although the name was not adopted till 1840, and in 1839 in Berlin, were for little children only. But in 1839 the death of his wife came as a severe trial to the enthusiastic teacher.

The era of kindergartens was, however, now at hand. It dates from the opening of a school for little children at Blankenburg on June 28, 1840. Kindergartens were subsequently opened in Rudolstadt, 1840, Gera, 1841, and Darmstadt, 1844. The gates of the future seemed wide open, and by the year 1847 there were ten additional kindergartens. In 1848 Froebel was occupied with a congress of teachers at Rudolstadt and a training course which he conducted at Dresden; and in 1849 he opened a kindergarten training school at Liebenstein. During this period of his life Froebel suffered bitterly from the attacks of calumny, but his friends stood faithfully by him; and in 1851 he found consolation in a second marriage, with Mlle. Luise Levin. There was need of every reinforcement, for the severest blow of all, the prohibition of kindergartens in Prussia by order of Von Raumer (*q.v.*), fell with all but crushing force upon the little band of enthusiasts on Aug. 7, 1851. Froebel rallied to attend the educational congress held at Gotha in April, 1852, at which he was welcomed with great honor; but his strength was exhausted, and on June 21, 1852, he died.

Froebel as a Student. — The originality of the philosophy of Froebel has been frequently overrated, for his opinions were derived, directly or indirectly, in the main from Fichte, Schelling, and Krause; but it is apt to be forgotten, on the other hand, that he was a man of wide and deep reading. He studied, for instance, Winckelmann's *Letters on Art*, the *Zendavesta*, Schelling's *Bruno*, and *On the World-Soul*, Pröschke's *Fragments of Anthropology*, Novalis's works, Arndt's *Germany*, and *Europe*, Pestalozzi's works, Arndt's *Fragments of Human Culture*, Seiler's educational works, Richter's *Levana*, Krause's works, Nägeli and Pfeifer's *Treatise on the Construction of a Musical Course according to the Principles of Pestalozzi* (which influenced the prominence afterwards given by Froebel to music in the kindergarten), Forster's *Travels in Rhineland*, Fichte's *National Education*, and doubtless many other works, from a number of which quotations are to be found prefixed to his articles in the *Sonntags-Blatt* and other journals.

Froebel's Relation to Pestalozzi. — Froebel's attitude as a pupil of Pestalozzi was not merely receptive and appreciative, but also highly critical. Pestalozzi emphasized handicraft for its value in physical training and technical preparation for vocation; Froebel for its inward correlative experience, which might be expected to contribute to the completeness of a human being. Froebel cared nothing for the merely mechanical in education. Again, Pestalozzi was more satisfied with the principle of observation *per se* than was Froebel, who insisted upon combining observation with activity. Pestalozzi, moreover, made home education central; Froebel aimed at the adaptation of the life of the child to all his institutional relationships, especially, for example, to his duties as a citizen. Froebel wrote of the Pestalozzian education : " The power and many sidedness of the educational effort made up for deficiency in unity and comprehensiveness ; the love, the warmth, the stir of the whole, the human kindness and benevolence of right, replaced the want of clearness, depth, thoroughness, extent, perseverance and steadiness." Froebel aimed at a greater unity of effort in the direction of means and ends. Pestalozzi's work in arithmetic, drawing, and language on the formal side, his *Mother's Book* on the social side, and the nobility of his educational intuition on the personal side, were of profound influence upon the development of Froebel's theories of education and his life.

Froebel's Philosophical Relations. — Froebel's was not a superficial educational theory, but rather a philosophy of life applied to education. Profoundly influenced by the idealist and romanticist thought of his day and nation, he appears to draw his inspiration now from Schelling, now again from Fichte. In general, he follows Schelling when his discourse is of nature, or of symbolism, or when he takes an æsthetic view of things; but Fichte whenever he thinks in terms of morality, ends, personality, will, duty, or citizenship. He had been introduced early in life to the works of Schelling, while his most intimate friends and his first wife were disciples of Fichte. To Fichte and Schelling, therefore, one must turn to appreciate the full implications of his philosophy of life and education. Among the philosophers contemporary with Froebel, Krause, who became his friend and adviser, had already effected a similar synthesis; and Krause's *Ideal of Humanity* is the prototype in some respects of Froebel's *Education of Man.* Among the fruits of the friendship of Froebel and Krause should be enumerated the long biographical letter of the former to his philosophical friend, and the gift to Froebel of Krause's books. Krause was responsible for the introduction of Froebel to the invaluable works of Comenius.

Froebel's Educational Philosophy. — The most systematic treatise on education by Froebel is the *Education of Man* (*Menschen-Erziehung*), which first appeared in 1826 in connection with the work of the Institute at Keilhau. Here Froebel discusses man as a child of nature, of humanity, and of God. All things, he claims, are pervaded by a universal law, and by an underlying unity, which is God. The destiny of all things is to reveal this underlying unity; and man has not only to reveal this unity, but to consciously realize it as the divine essence of his nature. " Education consists in leading man, as a thinking, intelligent being, growing into self-consciousness, to a pure and unsullied, conscious and free representation of the inner law of Divine Unity, and in teaching him ways and means thereto." The original nature of education is to be passive, a removal of hindrances to the development of life from within. Why does man, alone of all things, close his mind to the silent teachings of nature? The teacher ought to assume the existence of an unmarred original state in every human being, until the opposite fact is clearly demonstrated. If children's natures are unmarred, the eternal principle lives in them, and an interfering and mandatory education can do nothing but mischief. The imperative mood in moral instruction is only to be employed by the teacher, when between himself and the pupil there exists the invisible rule of a third something, the *right,* the *best,* which both pupil and teacher recognize to be sovereign. Man should be viewed and treated as having in himself unity, diversity, and individuality, corresponding to the threefold aspect of his nature as divine, natural, and human *per se.* Each human being should spontaneously represent these three phases in action. This is the doctrine of *self-activity.* The primary function of education is to permit self-activity to be manifested, but secondary functions are to correct aberrations and provide such means as experience has proved to be suitable. The external act is to be simply the manifestation of the spiritual nature that is the essence underlying every individual life. This, according to Froebel, is the great message also of Christianity. The teacher is to nurse the divine nature of the child; this is the method of all education.

Froebel's Teaching concerning Infancy. — In his account of infancy Froebel wavers between empirical child study and general philosophy. The child's first self-expression is to put forth force, whence comes the experience of resistance, which he greatly enjoys. Soon appears sympathy, manifested in his smile, which also reveals the beginning of self-consciousness. His unrest, tears, and little sorrows are to be investigated, and their cause removed. The most fatal development, which should be in every way guarded against, is apt to be willfulness. The early life of the child must be surrounded with cleanliness, purity, and truth. Above all, the feeling of community with others, resting as it does on an ultimate spiritual identity in human nature and even in things regarded as inanimate, ought to be cherished and brought into consciousness, when the opportunity arrives. A religious spirit brought into the nursery is the most supreme and permanent benefit that can be conferred on the future life of the child. " Let no one say the children will not understand it, for thereby he deprives them of their greatest good. If only they are not already degenerate, if only they are not already too much estranged from themselves and their parents, they understand it, and will understand it;

they understand it not through and in the thought, but through and in the heart." The life of man is a continuous development from infancy, and because this is so, the stage of infancy is more vitally important to education than is generally realized or confessed. From his very infancy, a man should be exercised in creativeness and productive work, with singleness of purpose and in obedience to the inner law of human nature.

Froebel's Teaching concerning Early Childhood. — Objects come to the child out of an unknown void, at first as separate and isolated things, but afterwards in their relations and individualities. In this process the child gradually distinguishes himself from external things, and at last comes to the period of the dawn of reason, just as in the development of the race before him. Thus the life both of the individual and of the race is a continuous whole, which develops according to a divine design. It was Froebel's conviction that this development always involves a contrast between *opposites.* He held that, just as in our thinking we are accustomed to analyze and put together again, so we find that objects in their actual occurrence are found to exist and develop in the form of opposites and reconciliations. (This view was apparently a confusion of a method of thought with a law of life.) Froebel described the development of the senses in accordance with this law rather than by observation, and wrongfully put sight after hearing as an opposite stimulated by it. Early movements should be watched with a view to prevent the occurrence of such as have no inner meaning. The child's first language, plays, and views of external things are worthy of careful attention and rectification. "The *plays* of childhood are the germinal leaves of all later life." "Play is the self-active representation of the inner from inner necessity and impulse." Food and clothing are to satisfy the simple needs of nature. The mother will educate the child's sensations and early associations of ideas consciously, yet carefully. Drawing, in which at first the child may discover for himself a crude pleasure in the mere change of surfaces, will soon open a new world to him. Drawing, in its turn, will naturally lead to number. Indeed, the child's life is full of its own interests; we should use this richness, and not disregard or stifle it. It is the adults that are dull; let them live for and with their children. This is, indeed, the great message of Froebel to humanity. "Let us learn from our children, let us give heed to the gentle admonitions of their life, to the silent demands of their minds. Let us live with our children; then will the life of our children bring us peace and joy, then shall we begin to grow wise, to be wise."

Froebel's Teaching concerning Boyhood. — There comes a time when the child passes into boyhood, the test being not one of age, but of analytical power manifested in the distinction of things from names and self from objects. Hitherto the watchword has been training, guidance; now it becomes instruction. The basis of instruction lies not wholly in the nature of the human being, but in the natural laws that govern both human beings and external things. The boy goes to school; and the true meaning of a school is "the conscious communication of knowledge, for a definite purpose and in definite inner connection." The primary aim of the school is to secure firmness of will for the boy; and to this end all his activities should proceed from and refer to the development of the internal. The necessary conditions are precept, example, and a good heart that is the outcome of proper influences upon early childhood. Of these influences, the chief are the life of play and of family relations. The boy, as well as the child, stands in need of these reënforcements; but his care is less for the activity as such, and more for its results. He loves to overcome obstacles. "To climb a new tree means to the boy the discovery of a new world." He collects, he models, he cultivates, he builds. By his experience of the present he becomes aware of the existence of the past; and this opens the door of story-telling and history. He rejoices in song. He seeks to understand himself and nature. His manifold self-expressions are symbols of an inner, spiritual life; and for parents and teachers the only clews to its nature. This is indeed a description of ideal boyhood. There may be shortcomings or perversions due to two causes: "in the first place, the complete neglect of the development of certain sides of full human life; secondly, the early faulty tendency — the early faulty and unnatural steps of development and distortion of the originally good human powers and agencies by arbitrary and willful interference with the original orderly and logical course of human development." But man is originally good; created with and for truth. His so-called original depravity is merely bad habit. "The boy is only satisfied when he has found Him to Whom he has been drawn by indefinable yearning, because only then will he have found himself."

Froebel's View of the School. — "The school endeavors to render the scholar fully conscious of the nature and inner life of things and of himself, to teach him to know the inner relations of things to one another, to the human being, to the scholar, and to the living source and conscious unity of all things — to God." In the school, therefore, the boy receives an insight which is of a different order from his previous superficial view of things. An intelligent consciousness, that of the master, mediates between the outer world and the scholar, and gives them mutual understanding. However powerless the village schoolmaster may feel to fulfill the requirements of this definition, the child has faith in him, and this makes all things possible, accomplishes all things. The vivacity and intensity of schoolboys ought to be regarded as a spiritually quickening power. " It is the spirit alone that makes the school and the schoolroom. . . . Never forget that the essential business of the school is not so much to teach and to communicate a variety and multiplicity of things as it is to give prominence to the ever-living unity that is in all things." Instruction and the school are to lead man to a life in full harmony with the knowledge of man, nature, and God. The poles of boy-life are the mind and the outer world, and language, which unites the two.

Froebel's Theory of the Organization of Studies. — The right grouping of studies in accordance with the inner nature of man appeared to Froebel to involve in the curriculum: (1) Instruction in religion, which assumes some degree of the religious spirit; it quickens the soul, and gives some insight into the nature of the divine. The human spirit is related to God as the thought to the thinker, the son to the father, related not in a material, but a spiritual union. To realize this relation is to be a Christian; in this sense, therefore, the school should first of all teach religion. (2) Natural science and mathematics. Nature represents what religion reveals, fulfills what religion demands. There can be no true contemplation of nature without the recognition of its relative unity, divine origin, and progressive development. God is the great artist; man and nature his cherished works of art — not mere art masks, but the revelation of the most inner divine personality. In nature man sees his aspiration, his destiny, his mission; and nowhere more clearly than in plants, especially trees. The life of trees is a revelation of human life, not alone in the individual, but also in the race, for the development of the human race is parallel to that of the individual man. The reason that a study of nature is so suggestive for the life of man is the common origin and subsistence of nature and man in God. In nature the ultimate cause of all things is force. Force naturally tends to exert itself in all directions equally, as it were, in a spherical way. The sphere is therefore the fundamental natural form, the form of the largest and smallest objects in nature, planets and particles. By variations in the planes and directions of tension, other forms than the spherical are derived. The first phase in material formation is represented by crystals. The form of the crystal represents the relative intensity in the different directions of the inner force. (Froebel believed that the analogy which he thought he had discovered between crystalline and human education throws important light on the development of man.) The action of inner forces from the center of a crystal will produce first a cube, second an octohedron, and third a tetrahedron. Other forms are derivative from these. All natural objects resemble crystals in proceeding from a heart point in their development; in fact, all may be grouped as crystalline, vegetable, and animal. Plants advance upon crystals, in exhibiting the inner force, " not only in multiplied diversity, but also in a state of progressive changes." For purposes of his theories, Froebel seized upon the fundamental concept of organism as described by Kant and the idealistic philosophers of the day. " The essential nature of the whole plant lies in some peculiar manner in each individual part of the plant." " Thus, inasmuch as the law of the individual part is repeated in the whole, the totality of all mundane forms, although but a small part of the great universe, is nevertheless, relatively, a great, individual, organized, and organic whole." Animals, again, constitute an organic whole. In animals and in nature generally the law is that the external becomes internal. With such a symbolic view of nature, Froebel desired above all things that the boy should be taught at an early period " to see nature in all her diversity as a unit, as a great living whole, as one thought of God." Fragmentary study of nature deprives it of life and impairs the vigor of the mind. Technical terms may wait; the things of nature themselves are a ladder between heaven and earth; number is a reliable guide in their diversity. Mathematics mediates between man and nature, between the laws of thought and the diversity of natural forms. Mathematics is the expression of life as such; and education without it is " a weak, imperfect patchwork." (3) Language. As religion manifests being, a unity, as nature manifests energy, diversity, so language strives to manifest life, — the connection of being and energy, of unity and diversity. All three seek to make the internal external; that is, all are modes of self-expression. Language represents, on the one hand, natural energy lifted into life, on the other, the human mind lifted into self-consciousness. Its ultimate roots express natural as well as spiritual operations. Language is therefore not purely conventional, or at least not arbitrary, but conforms to law, and should be taught according to its law. Accordingly, the language teaching of Froebel, like his science and natural philosophy, was symbolical; for example, he taught that in general, consonants indicate what is external, or force; vowels what is internal, or spirit. Language arises from an inner want of communication among men; and from a similar felt want its teaching should as far as possible proceed. " Writing is the first chief act of free and self-active consciousness." (4) Art and education in art. Art, in the process of education, must be regarded as the pure representation of the inner. It may be said to take the form of music, drawing, painting, or modeling, according as its material consists of tones, lines, surfaces, or solids. The schoolboy is not to be educated as an artist, but rather to appreciate art, and understand it. In art, as in everything, the clear representation of man as a divine, human, and natural being is the supreme aim of education. P. R. C.

See Kindergarten; Philosophy of Education; Activity; Symbolism in Education.

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FROST, JOHN (1800–1859). — Textbook author; graduated at Harvard College in the class of 1822; and for many years engaged in educational work in Philadelphia and Boston. He was the author of twenty-nine school books, including readers, speakers, grammars, and histories. W. S. M.

FULDA, MONASTERY OF. — One of the most famous centers of learning in the early Middle Ages. It was founded in 744 by St. Boniface (*q.v.*), assisted by Sturmius, a Bavarian noble who was sent to study the Benedictine Monastery at Monte Cassino, under the Benedictine rule. In a very few years the monastery rapidly increased in numbers, and gained a great reputation. But it did not attain the height of its fame until the ninth century, when the school was placed under the direction of Rabanus Maurus (*q.v.*), a favorite pupil of Alcuin (*q.v.*), and organized in direct imitation of the school at Tours. Einhard (*q.v.*), Servatus Lupus (*q.v.*), and Walafrid Strabo (*q.v.*) were among the most renowned pupils. Abbots from all parts of Germany, as well as nobles, sent pupils to be educated here. Twelve copyists were kept constantly at work, and under Rabanus' influence a library was instituted, which lasted to the seventeenth century. In the school there were twelve teachers, under the direction of a principal, who assigned the courses of lectures to be given. In keeping alive a study of the classics, Fulda may be numbered among the leading seats of learning in the medieval period.

See Middle Ages, Education in the; Monastic Education.

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FULLER, SARAH MARGARET (1810–1850). — The Marchioness of Ossoli; educated in the public and private schools of Massachusetts. She conducted a school in Rhode Island for some time, but was best known in education by her association with A. Bronson Alcott (*q.v.*) in the Temple School at Boston. She contributed several papers on education to the journals of the time. W. S. M.

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FULLER, THOMAS (1608–1661). — Biographer. historian and divine, born at Aldwincle in Northamptonshire. In the history of education, Fuller is important for the biographies of learned men to be found in the *Abel Redivivus,* 1651; and in the *Worthies of England* (1662); and for his *History of Cambridge University* (1655). His more general historical works, *History of the Holy War* (Crusades), 1639, and a *Pisgah-sight of Palestine* (1650), Bible history and geography of Palestine, attempt graphic descriptions likely to make history popular both by the subjects chosen and the method of treatment. Fuller's views on the good schoolmaster, on "the general artist" (*i.e.* the student in academic arts subjects in the university), on the good master of a college, are to be found in the *Holy State and the Profane State* (1642). He was a man of wide scholarship and vast memory. He is distinguished by his decisiveness of view in political and religious affairs, and yet a certain humanism that led him to escape the intolerance of the times. F. W.

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FUNCTION. — Any process, sufficiently complex to involve an arrangement or coördination of minor processes, which fulfills a specific end in such a way as to conserve itself, is called a function. This may be illustrated by digestion. There are a number of chemicophysical processes sustained by various structures that coöperate together in such a way as to restore the wasting tissues of the body, the specific end; at the same time the processes react so as to maintain the conditions of their own maintenance. The sum total of functions, in their reciprocal adjustment to one another, constitute life, which, accordingly, is defined in the same way as a function. Life (or functions, activities) includes within itself the distinction of organism and environment (*q.v.*).

The transfer of the conception of functions from biology to philosophy is a mark of a general tendency (1) to substitute a dynamic theory for a static one; (2) to place ends and purposes within the process of life experience instead of outside and beyond; and (3) to emphasize the continuity of process of development through biological, psychological, and social activities. In educational theory the fundamental character of the category of function is exemplified not merely in the increasing use of biological concepts, like adaptation (*q.v.*), but in the attempt to introduce into the school modes of active occupation which involve control of materials and tools in a process of realizing results which are felt to possess immediate or intrinsic value. J. D.

See ART IN EDUCATION; COURSE OF STUDY.

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FUNCTION.—In Mathematics.—A quantity that depends upon another quantity for its value, varying in general as the other quantity varies, is called a function of that quantity. Thus the area of a square is a function of its side, the area of a rectangle is a function of its base and its altitude, and interest is a function of the principal and the rate and the time. In general, the expression

$$a_0x^n + a_1x^{n-1} + a_2x^{n-2} + \cdots + a_{n-1}x + a_n$$

is an integral function of x, it being understood that $a_0, a_1, a_2, \cdots a_n$ are given numbers, and that n is a positive integer. This expression may be written $f(x)$, x being the variable. If a_0 is not zero, then this expression is said to be a function of x of the nth degree. In the theory of equations symmetric functions of the roots play an important part. Symmetric functions of the roots are functions in which all of the roots enter in the same way, so that the expression is unaltered in value when any two of the roots are interchanged. For example, if the roots of a quadratic are x_1 and x_2, then the following are symmetric functions of the roots: —

$$x_1 + x_2,\ x_1^2 + x_2^2,\ x_1^2 + x_1x_2 + x_2^2, \text{ etc.}$$

Given the general equation

$$x^n + a_1x^{n-1} + a_2x^{n-2} + \cdots + a_{n-1}x + a_n = 0,$$

the roots being $x_1, x_2, x_3, \cdots x_n$, and letting Σx^n stand for the sum of the nth powers of the roots (a symmetric function), we have

$$\begin{aligned}
\Sigma x &= -a_1.\\
\Sigma x^2 &= a_1^2 - 2a_2.\\
\Sigma x^3 &= -a_1^3 + 3a_1a_2 - 3a_3.\\
\Sigma x^4 &= a_1^4 - 4a_1^2a_2 + 4a_1a_3 + 2a_2^2 - 4a_4.
\end{aligned}$$

Similarly other symmetric functions are known and can be expressed. An important branch of mathematics is concerned with the theory of functions of a complex variable. (See COMPLEX NUMBERS.) Such functions deal with complex numbers of the form $x + yi$ where x and y are real numbers and i stands for $\sqrt{-1}$. These complex numbers stand for points in a plane, just as x and y stand for points on two arbitrary axes. Such complex numbers may be represented by $z, z', z'', \cdots$, and it is possible to have z', a function of z, just as it is possible to have y a function of x.

Besides these algebraic functions of a real and of a complex variable, we have various other kinds of functions. Of these one of the simplest is the trigonometric function. (See TRIGONOMETRY.) Thus we have sin x, cos x, tan x, cot x, sec x, and cosec x, making the six trigonometric functions usually studied.

The idea of function is of late entering more prominently into the work of elementary mathematics. Teachers will find that graphic work in algebra is an important aid in making the concept clear to high school pupils. There is no need for emphasizing the idea very much, although it undoubtedly has a place in algebra and geometry. D. E. S.

FUNCTIONAL PSYCHOLOGY. — See PSYCHOLOGY, FUNCTIONAL.

FUNDAMENTAL AND ACCESSORY. — See MUSCLES, FUNDAMENTAL AND ACCESSORY.

FUNDAMENTALS. — A term applied by popular usage to those school subjects which give a command over the written or printed expression of knowledge. It is thus fundamental to know how to read, for all knowledge acquired by any other means than direct personal experience or the speech of others can only be gained through ability to gain the thought from print or script. It is also fundamental to know how to write, spell, and compose sentences in order to communicate one's own thoughts through a written record. Arithmetical calculation is also a fundamental, since it involves the reading, writing, and manipulating of quantitative symbols. Hence the fundamentals of the course of study, as popularly cited, are the formal subjects, that is, reading, writing, spelling, English composition, and arithmetic. Grammar, because it is felt to be intimately related to English composition, is traditionally included. There is a distinct tendency of late, even among laymen, to include the subjects which provide fundamental facts, as well as those which give mastery over the fundamental forms and symbols of writing and printing. Hence it is not unusual to see geography and history, the older of the content subjects, included. On the same basis the studies of literature and natural science, with a more recent place in the curriculum, tend to be included. Thus the distinction between fundamentals and other school acquisitions inevitably tends to break down, even in popular acceptance. To the thoughtful educator any symbol, skill, or fact requisite to a successful life is a fundamental, and any subject which provides the opportunity to acquire some necessary tool, information, attitude, or discipline is fundamental. Thus in a more accurate and broad sense such subjects as manual training, drawing, music, and physical education may be regarded as fundamentals, and the term then ceases to have significance.

See FORM AND CONTENT.

FUNDS, APPORTIONMENT OF. — See APPORTIONMENT OF SCHOOL FUNDS.

FUNDS, SCHOOL. — See SCHOOL FUNDS; BUDGET, SCHOOL.

FURMAN UNIVERSITY, GREENVILLE, S.C. — The outgrowth of the Furman Academy and Theological Institution, established at Gagefield in 1827, which after a chequered career was moved to its present location with its present title in 1851. The institution is under the control of the Baptist State Convention. A preparatory department is maintained in addition to the college. Admission is by certificate from a high school, or by meeting requirements demanding about eight points of high school work. Courses are offered leading to the degrees of B.A., B.Sc., and M.A. There is a faculty of twelve members.

FURNITURE, SCHOOL. — See ARCHITECTURE, SCHOOL; DESKS.

FURNIVALL, FREDERICK JAMES (1825–1910). — An English scholar. He was the son of a surgeon at Egham, Surrey, where he was born Feb. 4, 1825. After a boyhood passed in various semi-private schools and a year at University College, London, he became a student of law at Trinity Hall, Cambridge, and was called to the bar in 1849. But he soon deserted the law for literature and education through his devotion to the social and intellectual advancement of the working classes. The least clerically-minded of men, he fell under the influence of a clergyman, also of Trinity Hall, who had deserted law for theology, Frederick Denison Maurice (*q.v.*), and became one of his principal lieutenants at the Working Men's College in Great Ormond St., London, which he founded on Oct. 30, 1854. Furnivall remained a constant teacher and friend of the college for the rest of his life, was for a long time captain of its Rifle Volunteer Corps, president of its rowing club, and a leading promoter of its social life. He took up the study of English language and literature, and was for many years Honorary Secretary of the Philological Society, and joint and then sole editor of the *New English Dictionary.* Even after it was removed, in 1885, to Oxford and placed under Dr. Murray's editorship, Dr. Furnivall's time was largely employed in unpaid researches for it. By the *Dictionary* and the numerous societies which he started, and the numerous volumes which he edited for them, Dr. Furnivall did more than any one to promote the study of the English language, literature, and history, and to enforce the entrance of these subjects into the curricula of schools and universities. The Early English Text Society was founded in 1864, the Chaucer Society and the Ballad Society in 1868, the New Shakspere Society in 1873, the Wyclif Society in 1882, the Shelley Society in 1885, and, sole instance of a poet's works becoming the prey of expositors in his lifetime, the Browning Society in 1881. In his own *Babees Book*, with the alternative title of *Manners and Meals in the Olden Times*, published by the Early English Text Society in 1868, Dr. Furnivall, in the text and still more in the Forewords, laid the foundation of the history of education in England. An eager researcher and worker in these fields to the last, he died at the age of eighty-five on July 2, 1910. A. F. L.

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Athenæum. July 9, 1910, p. 42.
Outlook. Vol. XCV, July 16, 1910, p. 548.

FÜRSTENSCHULEN.—Schools established by princes, somewhat in imitation of the Italian court schools. They form one of the earliest types of state schools established from the confiscated property of monasteries and churches in Saxony. They originated in an ordinance issued in 1543 by Duke Maurice of Saxony, to the following effect: "And since it is necessary for Christian doctrine and conduct and for all good ordinances and government that the youth should be brought up to praise God and obey him, and should be instructed and taught the language and arts and above all the Holy Writ, that in time there may not be a lack of church ministers and other learned people, we are determined to establish from the confiscated monasteries and church endowments three schools, one in Meissen with one master, three bachelors, one cantor, and sixty boys; the second at Merseburg with one master, two bachelors, one cantor, and seventy boys; the third at Pforta with one master, three bachelors, one cantor and one hundred boys, freely provided and maintained in all places with directors, servants, furniture, and all that is necessary." In 1550 the school at Merseburg was transferred to Grimma. The three schools, then, Meissen, Grimma, and Pforta, were intended for the education of boys from the state of Saxony. Board and education were free; the age of admission was from twelve to fourteen, and the prerequisite was a good grounding in elementary subjects and the beginnings of Latin. Vacancies were filled by cities, the nobility, and sovereigns. Able boys were carefully selected. Pupils were received from other states, but at high fees. The schools provided a six years' course of study in preparation for the universities, especially Leipzig and Wittenberg. A definite course of study was established by the Saxon Church Ordinance of 1580. The Fürstenschulen have had a continuous history up to the present, and have contributed a large number of men who attained eminence in political and literary life.

See Chivalric Education; Gentry and Nobles, Education of.

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FUSION. — This term is used in psychology to describe the process of combination and organization of elements into complex mental wholes. Thus, when one takes a substance into the mouth, he has an experience which is a fusion of taste and odor. The fusion in this case is so intimate that analysis is practically impossible without experimental methods. Another example of fusion is the combination of present visual experience with past tactual experience, as in the case of one's recognition of a hard object which he does not touch, but merely sees. Through fusion an element of consciousness takes on a value which it could not have in itself. Thus, the color of the object seen may lead to the recognition of the hardness or roughness of the substance. Hardness and roughness are not in the color experience proper, but are added meanings. Fusion is therefore a significant phase of mental development. The more completely the mind is equipped with the elements necessary for productive fusions, and the more the individual acquires the habits of complete fusions, the more significant any new experience. The educational processes involved in developing fusions are significant in contrast with those educational activities which merely tend to give new elements, especially when little heed is paid to the process by which these elements shall gain value through combination with the others. There are all grades of intimacy in mental fusions; sometimes the elements are inseparable, at other times easily distinguishable. Fusion is used in a special sense in describing the combination of tonal sensations. Some tonal fusions depend upon processes of combinations in the organ of sense, others upon perceptual fusions. C. H. J.

See Combination Tones; Music.

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